

CANADIAN MACHINERY

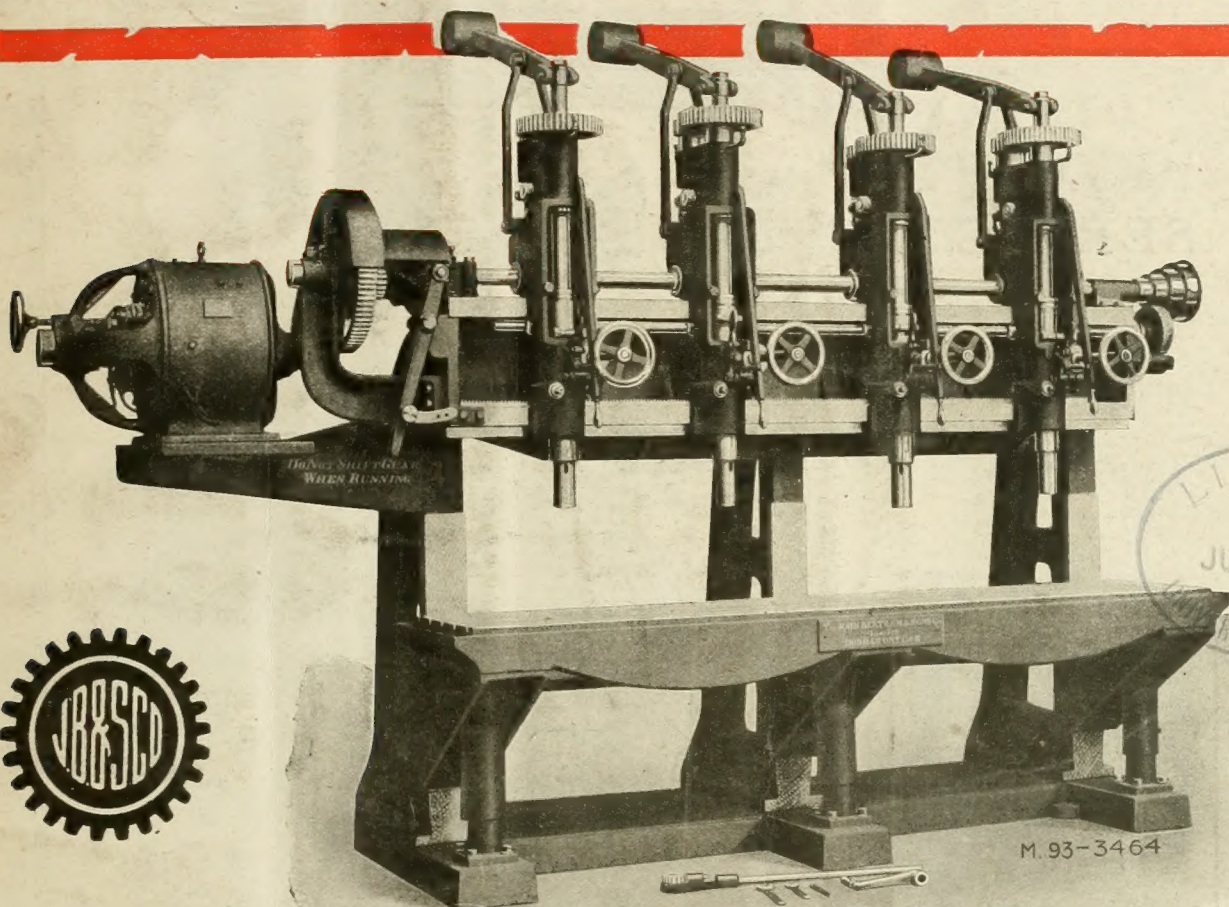
AND MANUFACTURING NEWS

A weekly newspaper covering in a practical manner the mechanical power, foundry and allied fields.
Published by the MacLean Publishing Company, Limited, Toronto, Canada.

Vol. XXI. No. 9.

Publication Office: Toronto, February 27, 1919

Subscription Price
\$3.00 per Year



BERTRAM

MACHINE TOOLS

John Bertram & Sons Company
Limited
Dundas Ontario

MONTREAL
723 Drummond
Building

TORONTO
1002 C.P.R.
Building

VANCOUVER
609 Bank of Ottawa
Building

WINNIPEG
1205 McArthur
Building

Illustration shows our 4-spindle multiple drilling machine for locomotive and other work. Capacity, four 2-inch holes in steel.

Drop us a line for photographs and full particulars.

Locomotive and car shop equipment, structural and bridge shop machinery, repair shop machinery, general machine shop equipment.

Photographs and full particulars gladly mailed upon request.

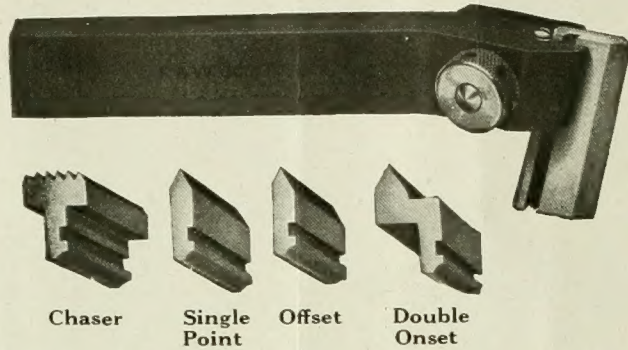
CANADIAN MACHINERY

SMALL TOOLS

P. & W. Threading Tools

PROMPT SERVICE

is assured at our nearest office.
Place your order there to-day.



Uses the same holder for chasers and single point cutters. The change can be made in a jiffy.

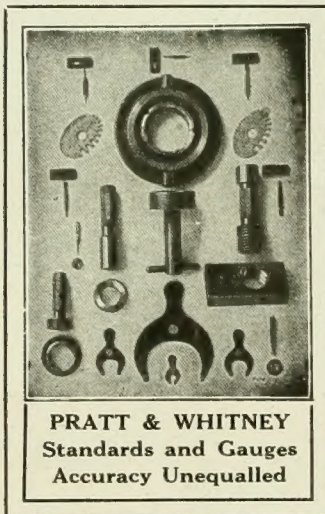
A few of its advantages:

Threads can be cut very close to shoulder.

Tools are sharpened by simply grinding off top of cutter.

Combines economy with all features essential in a threading and forming tool.

Cutters have 15 deg. clearance, which experience has taught gives the longest wear in various metals.



Precision Machine Tools

PRATT & WHITNEY CO. OF CANADA, LIMITED

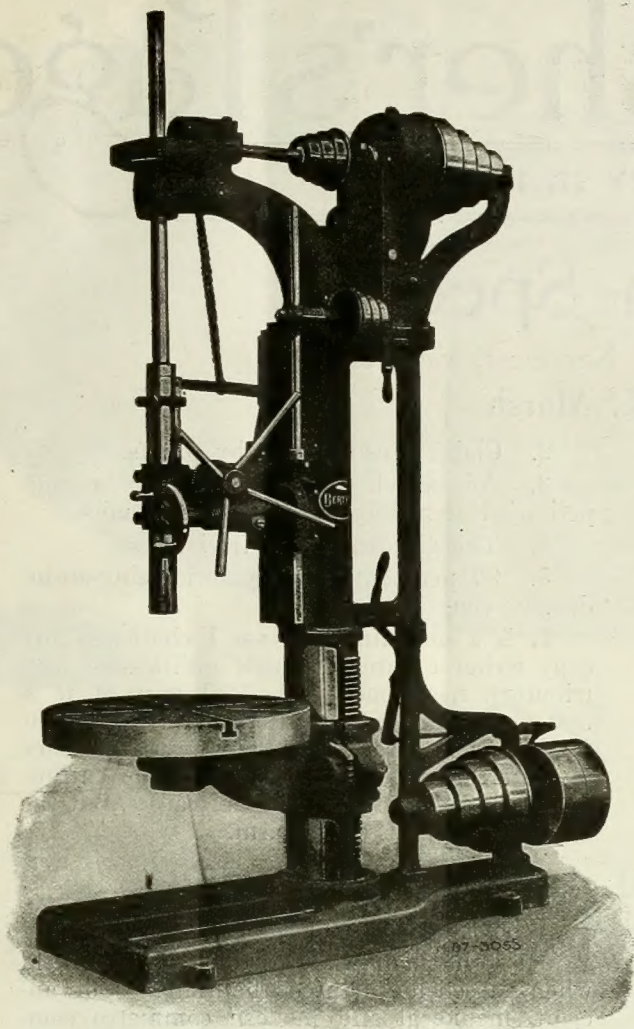
Works: DUNDAS, ONTARIO

MONTREAL
723 Drummond Bldg.

TORONTO
1002 C.P.R. Bldg

WINNIPEG
1205 McArthur Bldg.

VANCOUVER
B.C. Equipment Co.



**Locomotive and
Car Shop Equipment**

**Structural and
Bridge
Shop Machinery**

**Repair Shop
Machinery**

**General Machine
Shop Equipment**

30-Inch Vertical Drilling Machine

Photographs and full particulars gladly
mailed upon request.

WRITE US NOW

We'll be pleased to submit
photographs and full details
on any line or lines in which
you are interested.

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA



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723 Drummond Bldg.

TORONTO
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1205 McArthur Bldg.



The Publisher's Page

TORONTO

FEBRUARY 27, 1919

Old Man Specific

Physician Extraordinary to Nerveless, Enfeebled Copy

By P. K. Marsh

THE following article by P. K. Marsh in *Printers' Ink*, is one of the best things we have read in recent years on the subject of being specific in writing advertisements. We have often thought that "technical" advertisement could be made far more interesting, and a great deal more profitable if the advertiser would only be specific. Generalities won't do in personal selling—why should they be employed in advertising?

We venture to say a good many of our readers have opinions along just this particular line and we would like to hear from them expressing their ideas as to what constitutes good advertising of—say—mental working equipment.

Grover Cleveland once evolved a phrase which should be framed in 72-point bold brutal Gothic over every copy writer's desk, to hang there as an ever present caution.

In two words he crystallized the criticism merited by over 50 per cent. of advertising copy.

"Glittering Generalities."

From the copy-cub who writes glittering generalities to conceal his lack of information on his sales problem up to the seasoned veteran who befools himself that his flowery verbiage is "broad gauge," "institutional" copy, "generalitis" is an insidious bacillus which is no respecter of persons.

It is nothing new. In various years it has masqueraded under such varied noms-de-plume as "platitudes," "bromides," "hot air," "fluff," and the cruder, more modern "bull."

It not only minimizes results for the advertiser who pays for space in which to print it, but it hampers all advertising because it wastes the reader's time and makes him regard advertising as largely flapdoodle—(and you can't blame him.)

Now let's classify glittering generalities so that we will understand each other right from the start.

Here are the more common forms:

1. Spread-eagle flub-dub.

2. Claims unsupported by proofs.

3. Ads which can be made to fit a competitor's line merely by transposing names.

4. The glorification of trivialities.

5. 90 per cent. of "revolutionizing-an-industry" copy.

It is a sickening list, yet I challenge any copy writer to prove himself guiltless of contributory negligence. The sad part of it is that the more enthusiastic we wax over our product the more apt we are to be accessory to the crime. Laziness, ignorance and enthusiasm—these three are the chief causes, but the greatest of these is enthusiasm.

What's the cure?

Boy!—page old man Specific.

Who is old man Specific?

He's the man who sat by John Masefield when Masefield pictured the romance of ancient, mediæval and modern commerce completely, graphically and unforgettably in 15 brief lines. You copy men who take your professions seriously, read "Cargoes" and find how commonplace words can be made to glow with color and appeal.

Also he's the man who induced William Shakespeare to describe winter without once using the phrases "snowy mantle," "bleak landscape," or "glistening whiteness," but in the far frostier lines—

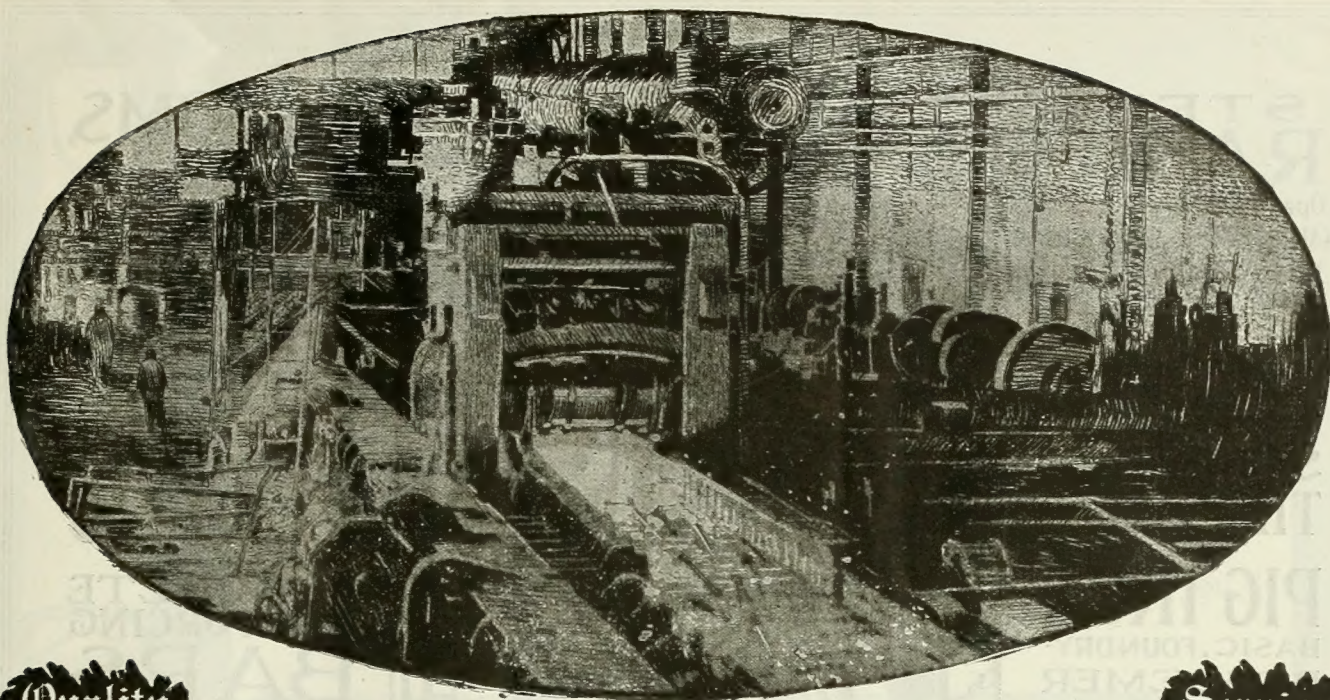
"When icicles hang by the wall,
And Dick the Shepherd blows his nail,
And Tom bears logs into the hall,
And milk comes frozen home in pail"—

There's only one three-syllable word in the four lines, but no one will argue that William was not thoroughly acquainted with his subject. Call in the average copy writer and ask him to write a twenty-seven-word description of winter—and see the contrast.

O. Henry was well acquainted with o. m. S. too. Witness the way he coaxed you into his stories without delay—

"At 10 o'clock p.m., Felicia, the maid, left by the basement door with the policeman to get a raspberry phosphate around the corner."

CONTINUED ON PAGE 62



Quality

Service

REASON IT OUT

Demand full value for every dollar by
spending it where you earn it

PURCHASE THE PRODUCTS OF CANADIAN MILLS

A Canadian Dollar is Worth
One Hundred Cents in Canada

THE
STEEL COMPANY
OF
CANADA

HAMILTON

LIMITED

MONTREAL

STEEL RAILS

Open Hearth Quality
(All Sections from 12 lbs
to 100 lbs per yard)

SPLICE BARS

STEEL TIE PLATES

PIG IRON

BASIC, FOUNDRY-
BESSEMER

SULPHATE OF AMMONIA



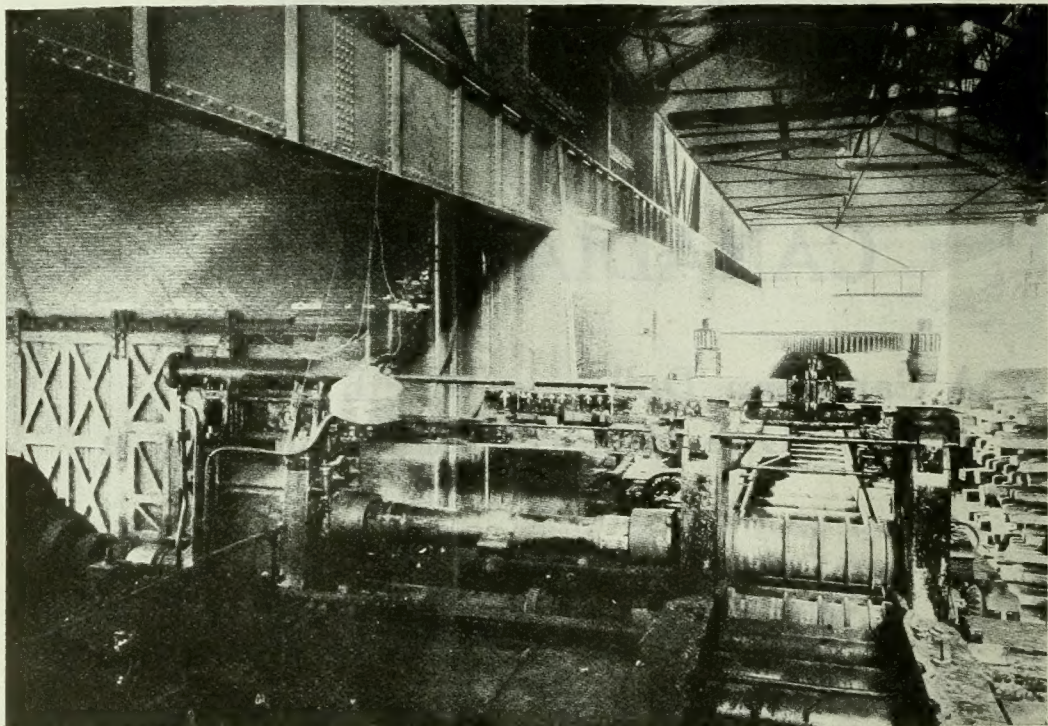
BLOOMS, BILLETS, SLABS, STRUCTURAL STEEL MERCHANT BARS

CONCRETE REINFORCING BARS

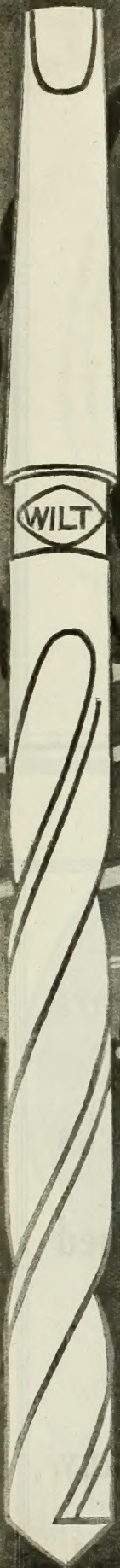
IRON, BRASS AND BRONZE CASTINGS

Sulphuric Acid.

Nitre Cake.



ALGOMA STEEL CORPORATION, LIMITED
SAULT STE. MARIE, ONTARIO



WILT

Machine shop foremen and superintendent who invariably specify "WILT" when requisitioning tools know **WILT Drills** are superior — are absolutely guaranteed against defective material and workmanship—are rigidly inspected before being shipped. To produce more, use **WILT Drills**. To produce more economically, use **WILT Drills**. Elimination of breakage alone will save you much.

HIGH SPEED AND CARBON TWIST DRILLS

WILT TWIST DRILL CO. OF CANADA, LIMITED

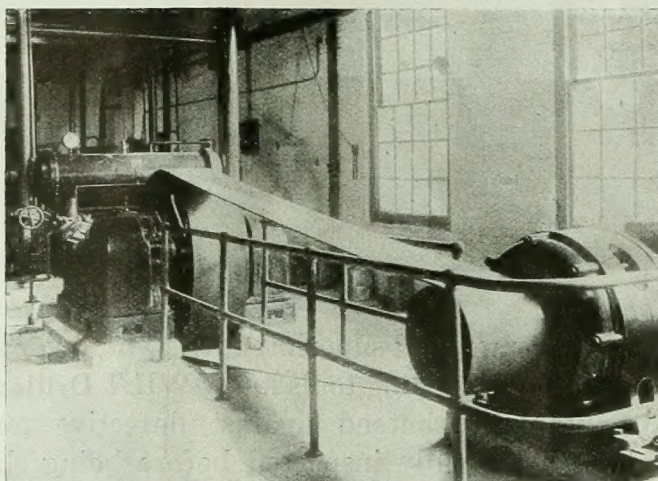
Walkerville.

Ontario.

London Office: Wilt Twist Drill Agency, Moorgate Hall,
Finsbury Pavement, London, E.C.2, Eng.



*"Where there's a WILT,
—there's the Way"*



**Repeat Orders Talk---There is another of our "PLB-2"
Air Compressors in this Montreal Plant**

The "PLB-2" Air Compressor Bulletin is K-301-A

Canadian Ingersoll-Rand Company, Limited.

Sydney Sherbrooke Montreal Toronto Cobalt Winnipeg Nelson Vancouver



ELECTRIC Steel Castings

**High Grade STEEL Castings
Of Every Description**

Prompt Deliveries

**Send us your drawings
for estimates.**

**THE ELECTRIC STEEL AND METALS
COMPANY, LIMITED**
WELLAND ONTARIO



Forging Billets and Bars

Electric Furnace

Alloy Steels, Die Blocks

Annealed

Piston Rods Rough Turned

Annealed

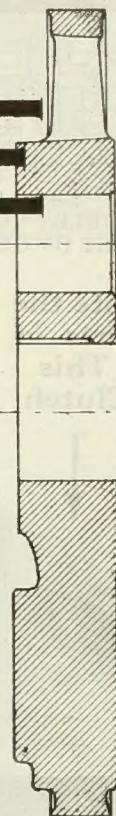
High Speed Steel

General Steel Company

Milwaukee, Wisconsin
DETROIT—823 Dime Bank Building

LOCOMOTIVE CASTINGS

CANADIAN STEEL FOUNDRIES, LIMITED
Transportation Building
MONTREAL



WOLFRAM
MADE IN THE U.S.A.
HIGH SPEED STEEL

A Keen Cutter

WOLFRAM
Is Both

Strong in the Neck

VULCAN CRUCIBLE STEEL CO.
ESTABLISHED 1900
Aliquippa Pa. U.S.A.
Represented in Canada by Messrs Norton
Callard & Company
MONTREAL Que.

Swedish Steel & Importing Co., Limited

Montreal New York Toronto Denver

Direct representatives of foremost Swedish mills: makers of

Tool Steels

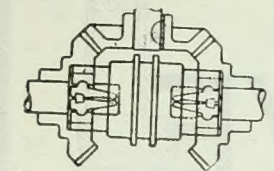
ALLOY STEELS, BILLETS, BARS, DISCS, SHEETS, HIGH SPEED STEELS, DRILL RODS, DRAWN BARS, SEAMLESS TUBING, COLD ROLLED STRIP STEEL, WELDING WIRE, WROUGHT AND ROLLED IRON, PIG IRON, STEEL AND IRON ENDS, HOLLOW AND SOLID MINING DRILL STEEL.

PROMPT SHIPMENTS from large stock

TRADE MARK
SS
"DOUBLE ESS"

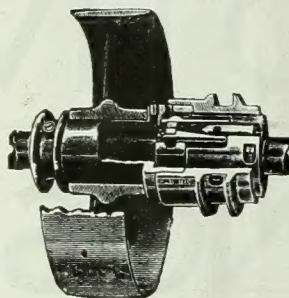
If any advertisement interests you, tear it out now and place with letters to be answered.

THE JOHNSON FRICTION CLUTCH FOR SERVICE

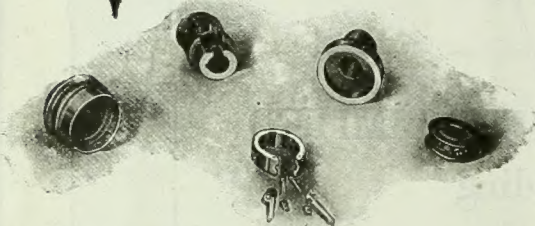


DOUBLE CLUTCH
IN NEST OF GEARING

Note the
Parts of
This
Clutch



STANDARD CLUTCH with
Pulley Clutch Engaged



The leading engineers are specifying *Johnson Friction Clutches*. Our years of experience in manufacturing friction clutches place us in an excellent position to take care of your requirements. The *Johnson Friction Clutch* has but few parts and is easily modified to meet any conditions. Have you noticed the concerns who are using *Johnson Friction Clutches*? There's a reason. Service is in back of it all. What are your requirements?

You Should Have Our Yellow Data Sheets and Booklet "Clutches As Applied in Machine Building"

AGENTS: CANADA—Williams & Wilson, 320 St. James St., Montreal. The Canadian Fairbanks-Morse Co., Ltd., Montreal and Branches. ENGLAND—The Efdandem Co., Ltd., 22 Newman St., Oxford St., London, W. 1., Sole Agents for British Isles. AUSTRALIA—Edwin Wood Pty., Hdwe. Chambers, 231 Elizabeth Street, Melbourne, Victoria.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

Coal
Coke
Iron Ore

Pig Iron

Victoria

FOUNDRY & MALLEABLE

Made by The Canadian Furnace Co.
Port Colborne, Ontario, Canada

M.A. HANNA & Co.

Sales Agents, CLEVELAND

Canadian Office:
104 C.P.R. Bldg., Toronto

FIRTH'S

Speedicut ^{HIGH} SPEED Steel
The Ideal Steel for Machining Shells

FIRTH'S CARBON TOOL STEELS
Standard Brands Highest Quality

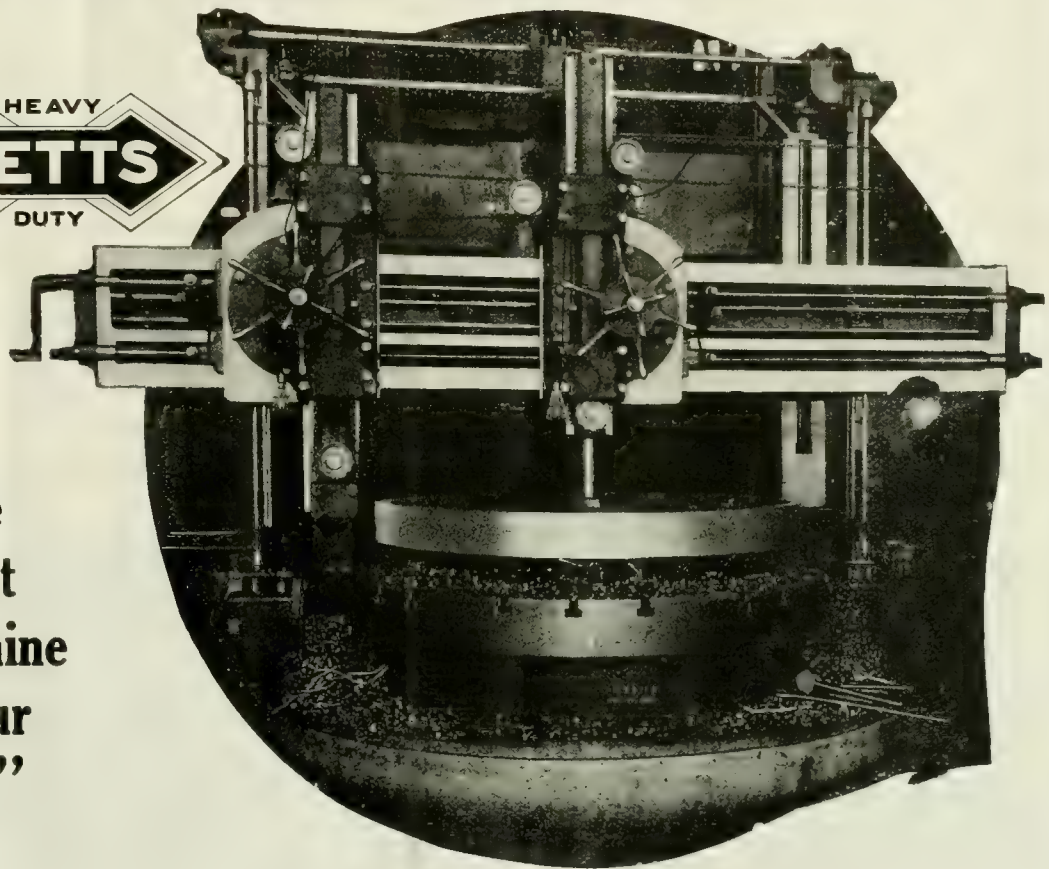
THOS. FIRTH & SONS, Limited, Sheffield, England

CANADIAN WAREHOUSES | 449 St. Paul St. West, MONTREAL
79 West Adelaide St., TORONTO

J. A. SHERWOOD
Canadian Manager

BETTS

Heavy Duty Boring Mill



**"The
Finest
Machine
in Our
Shop"**

That was the manager's verdict after this Betts Boring Mill had been put into service—and he wasn't talking about its looks either.

He meant "finest" accuracy in the machine itself and the work it turned out; "finest" in point of output; "finest" when operating conveniences were considered. And this man knows Boring Mills. He is running a big gear making plant, and he has used and is using many machines of many kinds. We value his opinion.

The photograph was snapped just as the machine was finishing a 76 in. diameter

gear blank. The face of this blank was 6 in. Material, steel. The chips at the side of the table show the character of the cut being taken.

We'll be pleased to send more details of this 7 ft. Boring and Turning Mill—or any of our smaller or larger machines of this type.

We'd like also to have you see some of these machines in operation and to have you question their operators and owners. We'll send a list of installations in your locality. Write us.

BETTS MACHINE CO.
408 Blossom Rd. Rochester, N.Y.
Formerly of WILMINGTON, DEL.



Thirty Years

TEXAS BANNER MILLS
Terrell Milling Company,
Terrell, Texas.

Magnolia Metal Co.

Aug. 30, 1918.

Gentlemen:—

Wish to state that we have been using Magnolia Metal for the past **THIRTY YEARS.**

Magnolia has been used continuously on the wrist of our Buckeye Engine, 85 H.P., 115 pounds pressure, with perfect satisfaction.

We shall continue to use Magnolia Metal.

Yours truly,

TERRELL MILLING COMPANY,
E. M. Friend, Supt.

PRACTICAL ENGINEER POCKET BOOK

Over 600 pages

A valuable reference work imported from England and sold as an advertising medium at the low price of 40c. post paid.

Address Montreal Office

SOLD BY LEADING DEALERS EVERYWHERE OR BY

MAGNOLIA METAL CO.

OFFICE AND FACTORY:

225 St. Ambroise Street, - MONTREAL



STAINLESS STEEL

FOR CUTLERY PURPOSES

Prices On Application

**Armstrong, Whitworth of
Canada, Limited**

HEAD OFFICE

298-300 ST. JAMES ST., MONTREAL

WORKS

LONGUEUIL, QUE.

BRANCHES

DOMINION BANK BLDG., TORONTO

27 KING WILLIAM ST., HAMILTON

McARTHUR BUILDING, WINNIPEG

IMPERIAL GENUINE BABBITT METAL *The Highest Grade Manufactured*



Made specially for all HIGH SPEED, HEAVY ENGINES and EXTRAORDINARY HARD WORK

Manufactured and guaranteed to give excellent service by

**THE CANADA METAL COMPANY, Limited, FRASER AVENUE TORONTO, Hamilton, Montreal
Winnipeg, Vancouver**

If what you need is not advertised, consult our Buyers' Directory and write advertisers listed under proper heading.

Nichrome Castings

At 1800° Fahrenheit

**Nichrome Carbonizing Boxes
Give Thousands of Hours
of Service**

Case Hardening Automobile Cam Shafts is made easier,
more dependable and economical.

Manufactured Under Henderson Patents

CANADIAN DRIVER-HARRIS CO.

WESTERN OFFICE AND DEPOT
CHICAGO
20 So. JEFFERSON ST.

WALKERVILLE, ONT.

CANADA
AMERICAN OFFICE AND WORKS
HARRISON, N. J.

BRITISH WORKS
MANCHESTER
ENGLAND



If any advertisement interests you, tear it out now and place with letters to be answered.

WAR is destructive. Peace is constructive. War has taught us many things, chief of which is the great value of Time. Time is the essence of your life and mine. Whatever saves Time, saves Life.

"Red Cut Superior"

The Nationally Known FIRST QUALITY

HIGH SPEED STEEL

Is the avowed Enemy of Waste and Inefficiency, and allied with Life. Save Time, Save Life

Are your Tools made of "Red Cut"?

VANADIUM-ALLOYS STEEL CO.

General Sales Offices, PITTSBURGH, PA.
Works, LATROBE, PA.

BOSTON
BUFFALO
CINCINNATI

CHICAGO
CLEVELAND
DETROIT
PITTSBURGH

MONTREAL
NEW YORK
TORONTO



Electrite

Electric furnaces, automatically regulated, the most modern methods, and the introduction of Uranium — make this a steel of truly remarkable cutting properties.

We know "Electrite" cannot be bettered — and stand ready to prove it to you.

LATROBE
ELECTRIC STEEL CO.
LATROBE, PA.

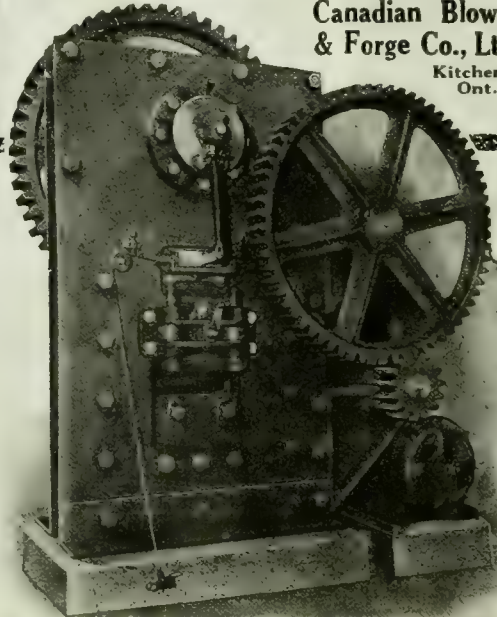
High Speed Steel

uranium

CANADIAN ARMOR PLATE

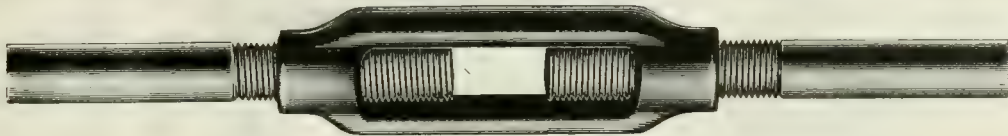
PUNCHES, SLITTING SHEARS, and BAR CUTTERS are dependable. They are built of "Armor Plate" steel—tensile strength 75000 lbs. per square inch—7½ times as strong as cast iron. That means a lighter and stronger machine—a machine built to take a lot of punishment. Write for Catalog P/S-16.

Canadian Blower & Forge Co., Ltd.
Kitchener Ont.



CANADA FOUNDRIES & FORGINGS LIMITED

DROP FORGED STEEL



TURNBUCKLES

16 Sizes, with or without Stubs
Large Stock---Quick Action

Produced at

Canadian Billing & Spencer Plant
Welland

A Boy

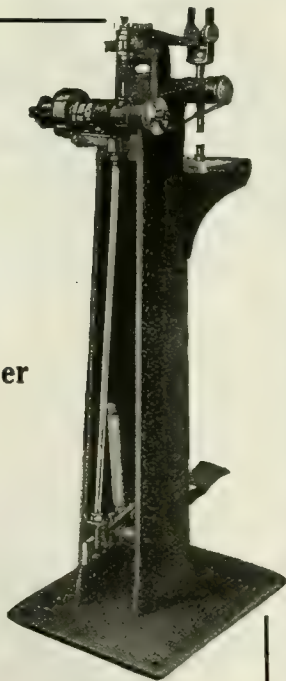
with this

GRANT

Rotary Vibrating Riveter

will do better work and more work than any man with any other riveter. A dollar-a-day boy will place rivets in small, out-of-the-way corners or close up to the shoulder of the casting that will be as smooth and good looking as any placed in easy-to-reach spots. Can you say that of any other riveter, even with a man operating?

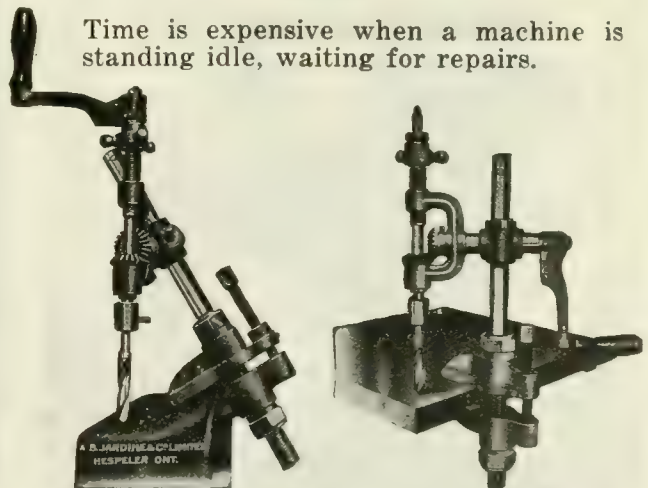
And a boy and a Grant Rotary Riveter are a safe combination. For although the Grant can be operated at a speed limited only by that at which the operator can feed the machine, its friction stopping device enables a boy to regulate its speed at will. Write us.



Grant Mfg. & Machine Company
Bridgeport, Conn.

Jardine Universal Ratchet Drill

Time is expensive when a machine is standing idle, waiting for repairs.



On the average repair job, this machine completes the drilling in less than the time required to set an ordinary ratchet to begin.

Weight, 40 lbs. Price, \$26.50 net.

Sold by all Machinery and Supply Houses

A. B. JARDINE & CO., Limited
HESPELER, ONTARIO

“WACO”

TRADE MARK



TRADE MARK



High Speed Steel

“Double Waco” Quality—for
Quick Production Work

“Turtle Brand”—High-class
Tool Steels, Files, Drills, etc.

MANUFACTURED BY

WM. ATKINS & COMPANY, LIMITED

RELiance STEEL WORKS

Established 1870

SHEFFIELD, ENGLAND

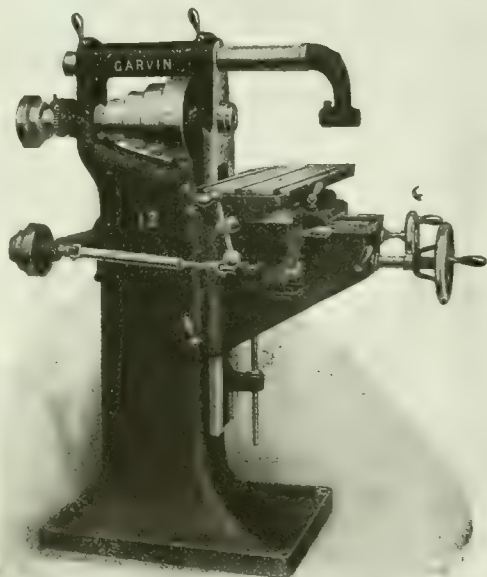
*Sole Representatives
for Canada*

GEO. A. MARSHALL & CO.

1118 Queen Street West, Toronto, Ontario

*Phone Park.
250*

GARVIN



No. 12 Plain Milling Machine—Use Code Abrade

NO. 12 PLAIN MILLING MACHINE

FOR ALL LIGHT MANUFACTURING

This machine is built especially strong and substantial for a tool of its capacity, and has many valuable features worthy of special mention. The slide is fitted with a quick pitch screw, giving one inch per turn. This combines the rigidity of a rack feed with the steadiness of the screw feed. The table has an oil pan all around it, with finished edges—automatic feed, trip and reverse—adjustable nut on the feed screw to take wear—the Feed Screw is hardened.

Adjustments 18 x 6 x 15 in.

For Further Information ASK YOUR DEALER
OR WRITE US DIRECT

IMMEDIATE DELIVERIES

Send for Complete Catalog

Manufactured by

THE GARVIN MACHINE COMPANY

Spring and Varick Streets

(Visitors Welcome)

50 Years New York City

STEEL *for* Every Commercial Purpose

We are the only company in Canada producing steel ingots by the "HARMET" Liquid Process, a process that makes these ingots vastly superior to the ordinary kind, improving the physical properties and reducing the waste of ingot.

We can supply forgings of all shapes and sizes made of ordinary or "HARMET" Fluid Compressed Open-Hearth Steel on the Shortest Notice.

**Nova Scotia
Steel and Coal
Co., Limited**

Head Offices:
New Glasgow, N.S.

Western Sales Offices:
Room 14 Windsor Hotel
MONTREAL



Steel Ingots
by the
HARMET
Liquid Process

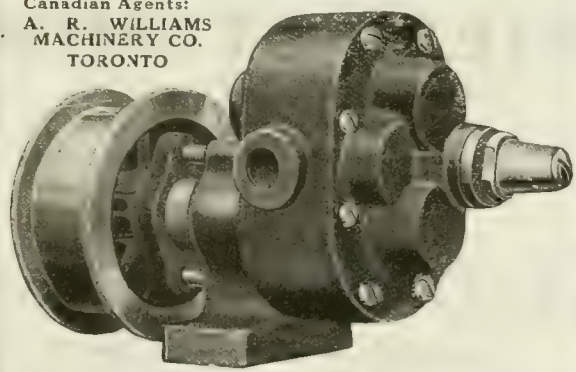
TRAHERN

ROTARY GEARED PUMPS

Use the Individual Pump
Different classes of work require different compounds. By using the individual system, as many different compounds as desired may be used. This is a valuable feature. Trahern Rotary Geared Pumps. Would you like to try one? Write.

Trahern Pump Company, Rockford, Ill.

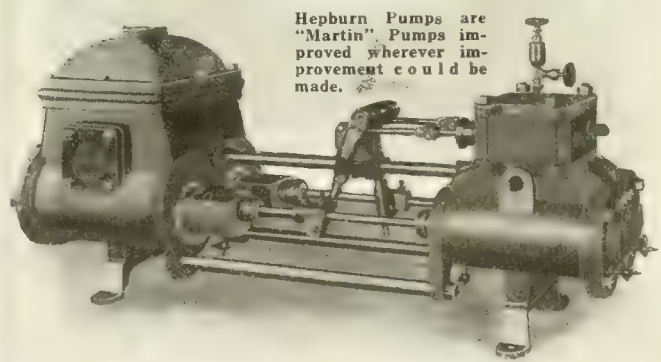
Canadian Agents:
**A. R. WILLIAMS
MACHINERY CO.
TORONTO**



Hepburn Pumping Machinery

Our line embraces standard duplex pumps for boiler feeding and for fire and general service; tank or low service duplex pumps; duplex hydraulic pumps for service in connection with hydraulic lifts and presses, accumulators and oil presses; pressure or mine pumps; horizontal power pumps and air and circulating pumps, etc.

Hepburn Pumps are "Martin" Pumps improved wherever improvement could be made.



JOHN T. HEPBURN, LIMITED
18-60 Van Horne Street Toronto, Ontario

IMMEDIATE DELIVERY — Hamilton Stock

FOR IMMEDIATE SHIPMENT we offer the following

FORD-SMITH GRINDERS

Two 16" Water Tool Grinders
Four 12" Bench Water Tool Grinders
One 10" Bench Water Tool Grinder
One No. 14 General Purpose Grinder
Four No. 12 General Purpose Grinders
Five 6" Bench Grinders
Four 8" Bench Grinders
Two 20" Heavy Type Floor Grinders

DIAMOND TOOLS

A quantity, imported from England, made with diamonds weighing about a carat and a half each and of the very best quality.

MOTORS—Used, but in first class running order:

One Lancashire 13 h.p., 3 phase, 720 r.p.m. 550 volts
One Lancashire 6½ h.p., 3 phase, 700 r.p.m., 550 volts
One Can. Westinghouse 15 h.p., 2 phase, 1245 r.p.m., 220 volts
One Can. Westinghouse, 5 h.p., 2 phase, 1880 r.p.m., 200 volts.
One Can. Crocker-Wheeler, 5 h.p., 25 cycles, 750 r.p.m., 550 volts, 3 phase

FRICTION CLUTCHES

Seven No. 4 Single Friction Clutches, manufactured by Carlyle-Johnson Machine Co., Manchester, Conn.

FORD-SMITH MILLING MACHINES

Three No. 2 Plain Millers, complete
Two No. 3 Plain Millers, complete
Two No. 2 Universal Millers, complete
One No. 3 Universal Miller, complete

MILLING MACHINE INDEX HEADS

One 12" Cincinnati Plain Index Head
Two No. 1 Kearney & Trecker Plain Centres
One No. 2 Kearney & Trecker Plain Centres
One No. 2 Kearney & Trecker Universal Dividing Head

DRILLS

One 20" Pollard & Shipman Single Geared Drill
One Hamilton Tool Co. Speed Drill

AIR CYLINDERS

Eight 6½" Air Cylinders, manufactured by Manufacturers Equipment Co., Chicago
Four 12" Air Cylinders

We solicit your enquiries re above. On our Special and Standard Grinders, Belt and Motor driven, we can make prompt deliveries.

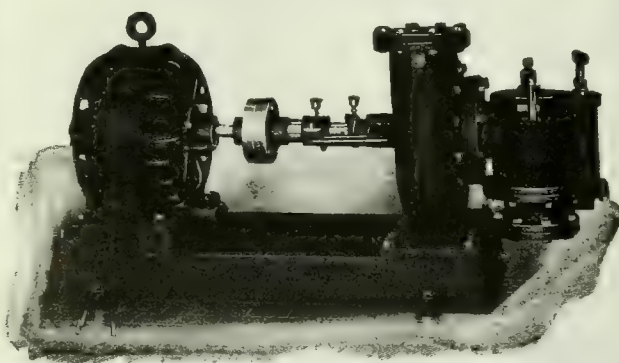
The Ford-Smith Machine Co., Ltd.

Manufacturers of Milling Machines, Floor Grinders, Polishers, Disc Grinders, Swing Grinders

Hamilton, Ontario, Canada

We solicit your inquiries for

Pumping Machinery and Steel Barrels



Pumping Machinery for marine and stationary work — Vertical and Horizontal.

Steel Containers from 12½ to 92 Imp. gal. capacity.

The Smart-Turner Machine Co.,
Limited
Hamilton, Canada



STEEL STAMPS

FOR MARKING SHELLS, ETC.

We will Give You Satisfaction on all Work of this Kind.

Send for Prices

PRITCHARD-ANDREWS CO.
OF OTTAWA

General Engravers and Die Sinkers

264 SPARKS ST.

OTTAWA, CAN.



"Not Steel but its Master"

Anecdotal

The superintendent in one of the largest machine shops on the continent recently tried an experiment with the idea of substituting High Speed Steel for STELLITE under the delusion that High Speed Steel would do as well and be cheaper.

He gave four tools tipped with High Speed Steel and instructions to do his best, to one of the operators. The production report was watched carefully for a week and it was noted that the man with the High Speed Steel tools was daily in advance of his fellows.

The superintendent then paid a visit to the operator to compliment him on his work when the following conversation ensued:—

Q—"Are you the chap I gave the High Speed Steel tools to?"

A—"Yes, sir."

Q—"How do they work?"

A—"Fine, there they are on the bed of the lathe."

Q—"What have you got in the lathe?"

A—"STELLITE—how do you think I got my production?"

MORAL—If the operator wants STELLITE, get it for him—he knows, and the results show in added production.

Deloro Smelting & Refining Company, Limited

TORONTO
200 King Street West

H.O. and WORKS: DELORO, ONT.

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315 Craig Street West

Chapman

Double Ball Bearings

CONSERVE POWER! There is too much power going to waste the world over. This fact has been noted by the British Government and sweeping reforms are contemplated in Great Britain.

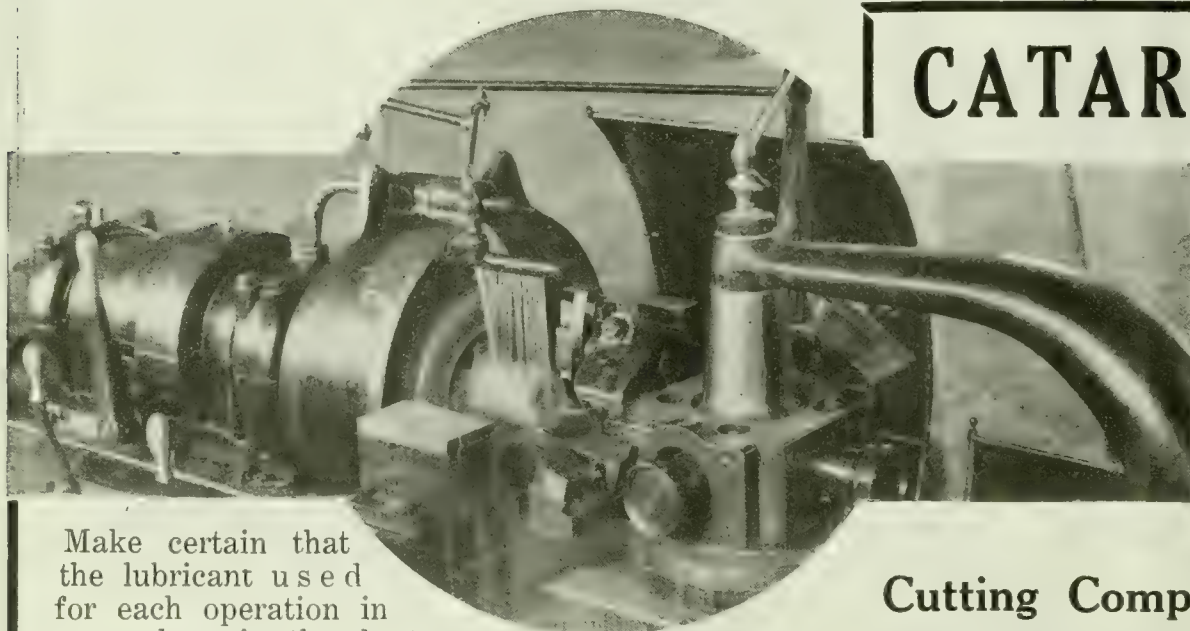
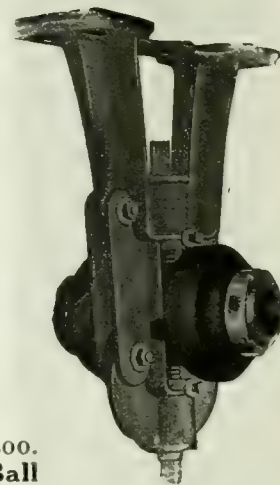
Canada also wastes much power. A reform is necessary here, too. Babbitt bearings are being used too often where **Chapman Double Ball Bearings** should prevail. The adoption of Chapman Double Ball Bearings, wherever an axle or shafting needs support in the transmission of power, results in a saving of 75% of friction loss.

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CATARACT

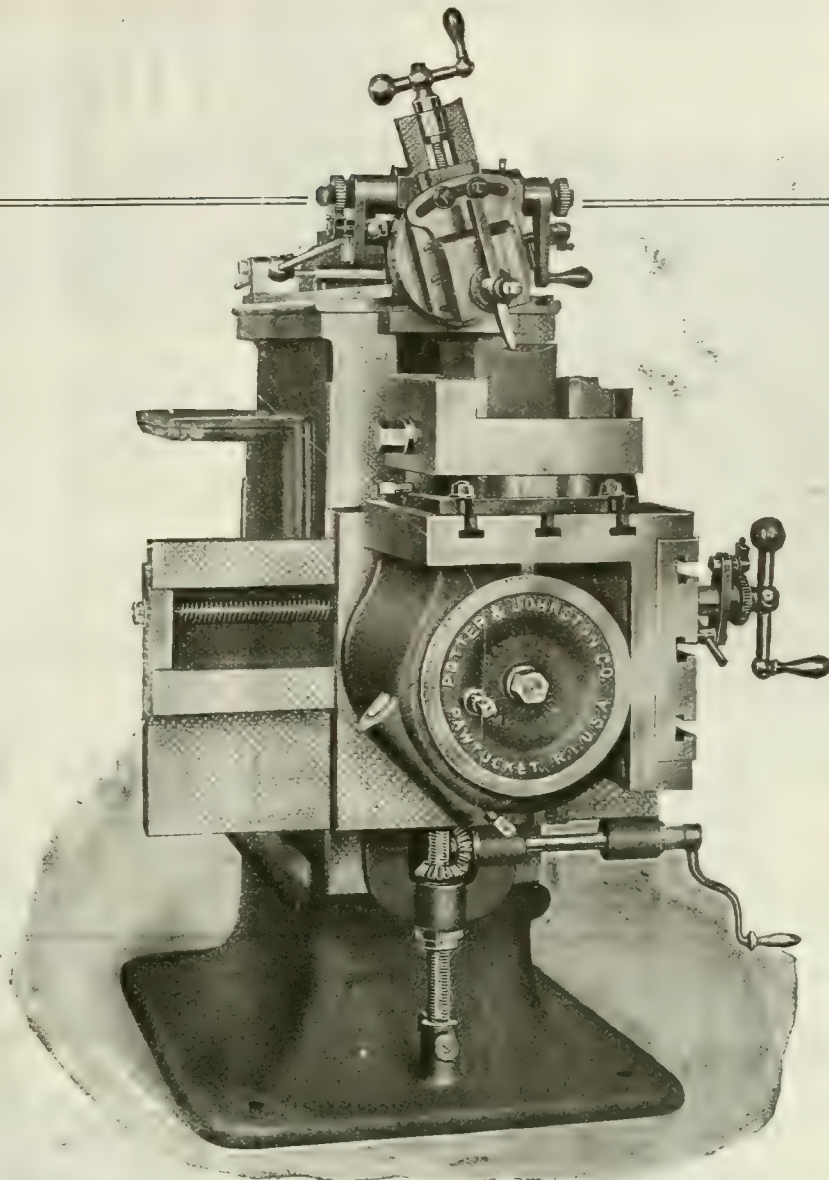
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Make certain that the lubricant used for each operation in your shop is the best obtainable for the purpose. Otherwise your men and your tools and your machines work at a disadvantage.

Write us to-day that we may demonstrate how Cataract Lubricants can increase production and reduce cost in your plant.

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Potter & Johnston 15-inch Universal Shaping Machine

Simplicity of design, convenience, extreme care exercised in their manufacture, and the many universal features of the machines, combine to make the UNIVERSAL SHAPING MACHINES the most efficient and thoroughly reliable tools of their type on the market to-day, and place them in a class by themselves. The above illustration shows our 15" Universal Shaping Machine with Swivel table having auxiliary tilting side, power down feed on any angle, POWER ROTARY FEED for planing internal curves, automatic feed stop, graduated collars on tool head feed screw and table feed screw, swivel vise with graduated base.

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Head Office: 1501 Royal Bank Building, TORONTO, CANADA

Works: GALT, ONT., CANADA



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The "Keith" Fan is the one that will give you continued and unqualified satisfaction.

Our New Catalogue No. 55 has just come from the Press. Tell us where to address it and you will receive one by first mail.

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This Machine—the Forbes— Feeds the Cutters to the Job

Moreover, readily carried to the pipe inside the shop or anywhere out in the yard.

It Cuts Clean Threads that Make Tight Joints

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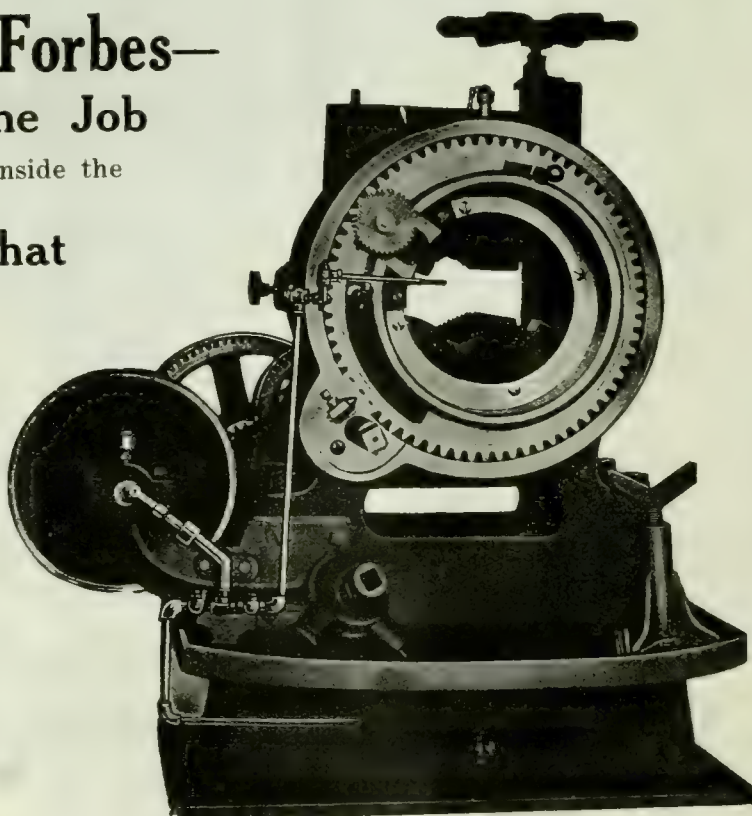
The pipe remains firmly fixed in the self-centering vice. The dies, revolving, cut-off or thread, as the case may be.

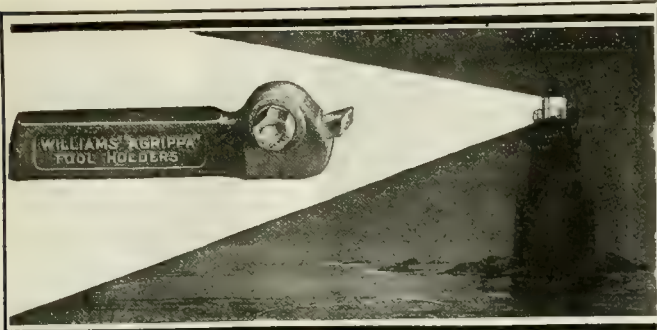
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Nothing that is good fears the light and there is nothing *but* good in

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"THE HOLDERS THAT HOLD"

Good design, good material, good workmanship and good service. They were taken in quantity by Uncle Sam and his Allies and by domestic and foreign manufacturers for use here and over there, because they, and they alone, save the most machine time on the job, lose the least repair time off the job and require the least shifting between jobs.

Tool Holders for

TURNING PLANING THREADING
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"The Drop-Forging People"

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A. G. LOW CO., Ltd., 45 Pacific Ave., Saskatoon,
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The Only Grand Prize for TOOL HOLDERS

Awarded separately and independent of other
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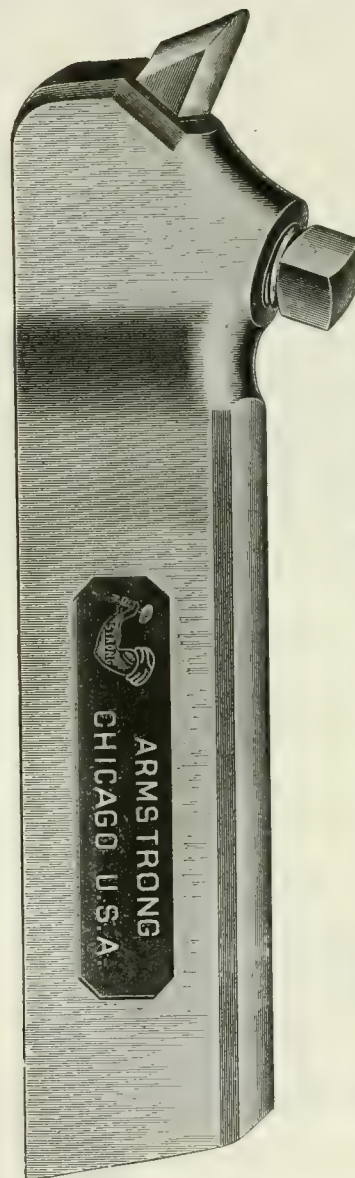
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HIGHEST AWARD

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THEY ALWAYS
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The Panama-Pacific MEDAL OF HONOR was also won by
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One hour's work with a dull file will cost you more in wasted labour than a new file.

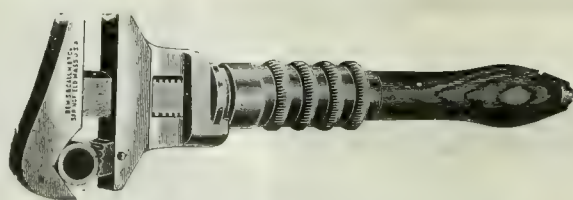
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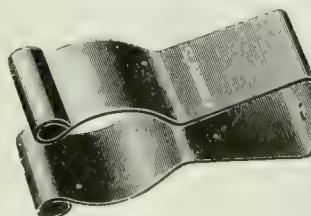


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Work To $\frac{1}{4}$ " Thick**

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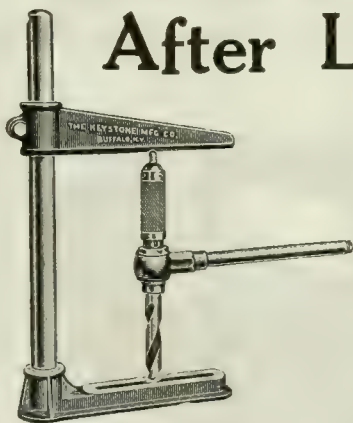



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We like to think that the reputation of Keystone Tools is built upon a foundation of service with **Quality** the Keystone rather than a copyrighted name. For it is conceivable that imitators, or even the whims of courts, might rob us of our copyrighted name. But who could take "Keystone Quality" from Keystone Tools?

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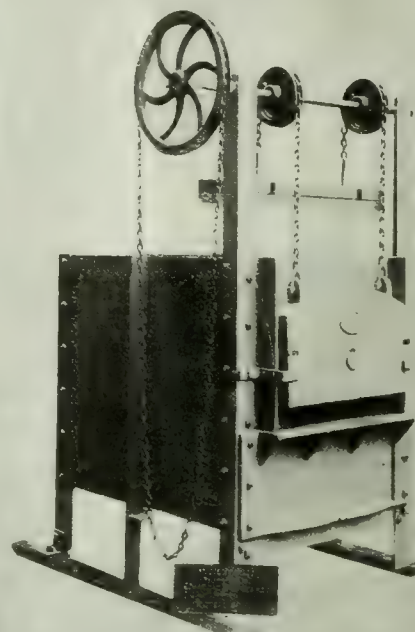
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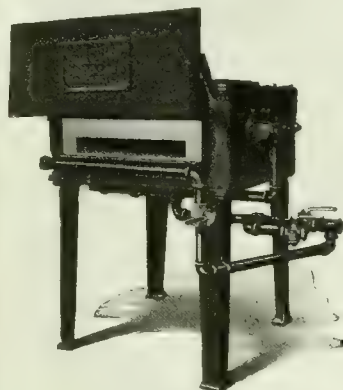
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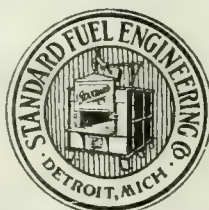


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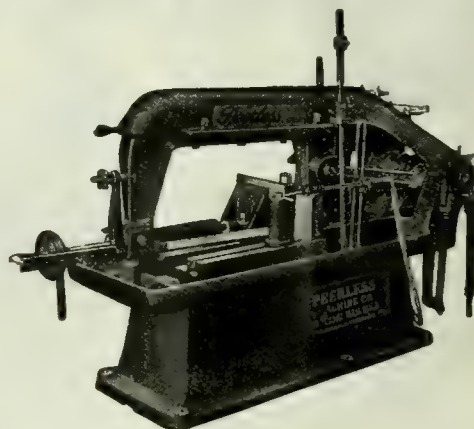
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THE NEW STANDARD

Increases Production—50 to 100%



REPEAT ORDERS—

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The one striking feature about our repeat orders is that so many of them come from large concerns who had been reasonably satisfied with other standard makes before they put in their first PEERLESS High-Speed, and since then they have sent us order after order for more and more of our machines.

Surely there must be some good reason for this, which will be perfectly clear to you when you try out a Peerless for yourself.

Let us ship you one on thirty days' trial. If you don't keep it we pay freight both ways.

PEERLESS MACHINE CO.

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GILBERT & BARKER

FUEL OIL BURNING — FURNACES —

Delivered from Stock

Above photo shows G.&B. furnaces and quenching tanks in the hardening room of a large manufacturing concern.

With this concern as with hundreds of others, there is no lingering doubt as to whether they have adopted the proper heat treating apparatus, they know that G.&B. equipment and service is the very best obtainable.

Whether your heat treating problem is that of welding—forging tempering—brazing—hardening or annealing, our expert engineers are ready to advise with you.

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GILBERT & BARKER MANUFACTURING CO.
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The "RACINE"

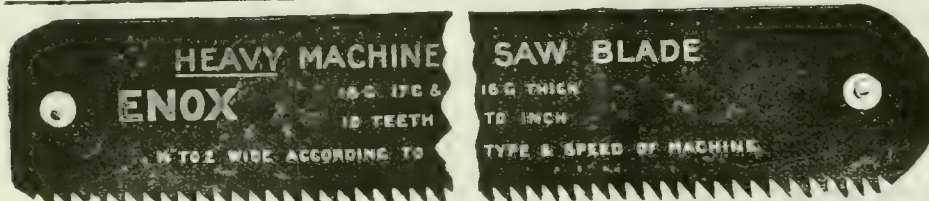


For Speed
For Accuracy
For Quantity
Production
For Saving in
Blade Costs
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Advise us the size stock you intend cutting and we will quote you on a machine suited to your requirements.

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ENOX
Hacksaw Blades

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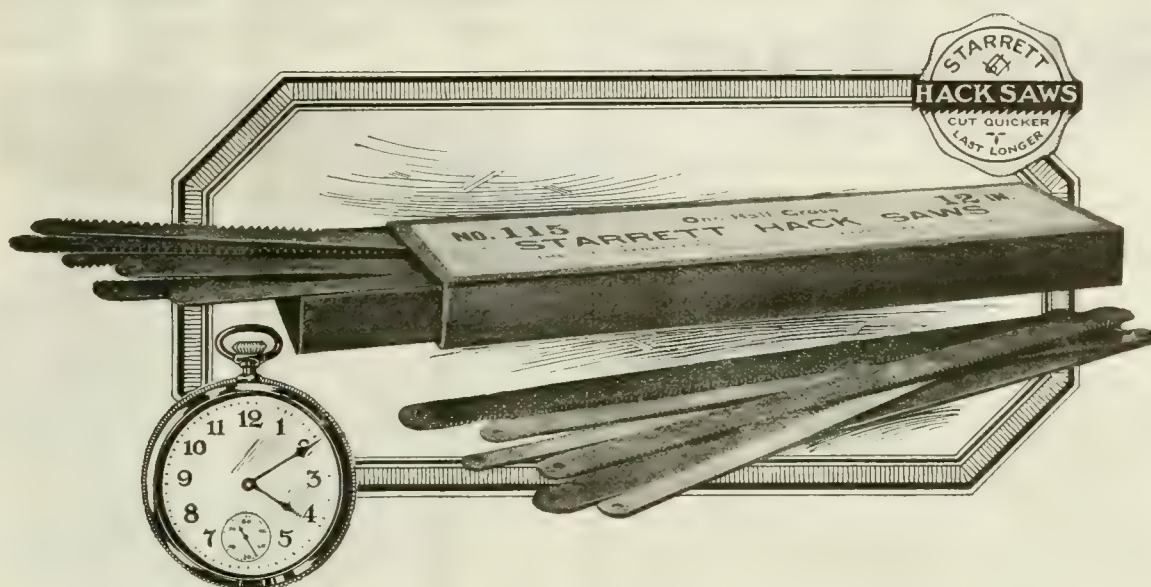
46 Upper Thames St., London, E.C. 4, England.

Works: Greenwich, S.E. 10

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Agents for British Columbia—The A. R. Williams Machinery Co., Limited, 495 Railway St., Vancouver, B.C.



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The greatest service a hack saw can give to assure economy is to shorten the time of cutting a given piece of material. Time today is vital—the most valuable raw material—don't waste it. Time has often been the difference between profit and loss. Remember that Starrett Hack Saws cut fastest—so saving time.

Write for our Catalog No. 21-3.

Besides the hack saws and frames it shows the many styles and sizes of Starrett fine precision tools.

The L. S. Starrett Co.

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Notes on Grinding

NORTON COMPANY,
WORCESTER, MASS.

No. 23A

Wheels for Grinding Cutters

The wheel for grinding cutters must be of a soft, free-cutting grade; the cut must be light and never forced.

The wheels most commonly used are about 46 grains, grades J and K; the coolest cutting abrasive is Alundum. Wheels finer than 60 grain should never be used for cutter grinding of either high speed or carbon steel. Finer wheels are more likely to burn the work than coarser wheels.

Form cutters are usually ground with a saucer or dish wheel. They are held on a short arbor, as illustrated here, and ground on the face only. It is important that the operator keep the cutting edge in a radial line to retain the shape. In this particular type of cutter, it is necessary to do the grinding with the tooth-rest, on the back of the cutting tooth instead of on the face.

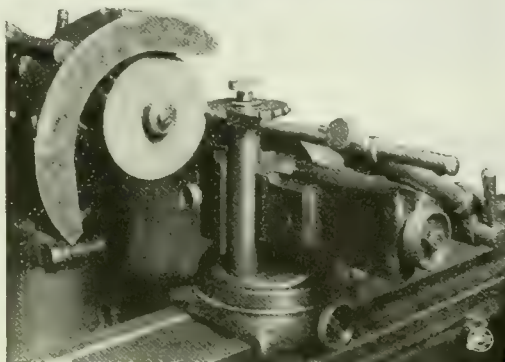
Cutters of the side-mill type are ground on the top in exactly the same manner as the plain cutter. A cup wheel is employed for grinding the sides, the cutter being held on the edges of a special arbor, as shown in the illustration.

For plain milling cutters, the wheels most used are Alundum 3846 J and K, although 3860 I, vitrified and silicate, is a popular grade in saucer shapes, such as Brown and Sharpe No. 60.

One of the most popular wheels for grinding gear cutters is saucer shape Alundum 3846K. Another good wheel is Alundum 3850 J. In the smaller diameters, 3860 K is commonly used.

On inserted tooth milling cutters, 3846 J and K, are the most popular wheels, and under certain conditions 3836 L meets the requirements.

NORTON COMPANY



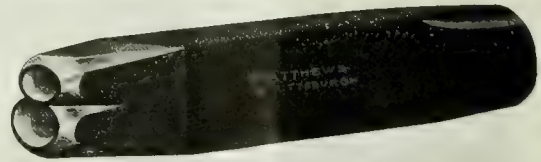
Canadian Agents:—The Canadian Fairbanks-Morse Co., Ltd., Montreal, Toronto, Ottawa, St. John, N.B., Winnipeg, Calgary, Saskatoon, Vancouver, Victoria. F. H. Andrews & Son, Quebec, Que.

Grinding Wheel Plants, Worcester, Mass.

ELECTRIC FURNACE PLANTS
NIAGARA FALLS, N. Y. CHIPPAWA, ONT.
NEW YORK STORE CHICAGO STORE
151 CHAMBERS ST. 1110 JEFFERSON ST.



MARK YOUR PRODUCTS THE "MATTHEWS" WAY



"Matthews-made" steel stamps and lettering dies make easily read and durable marks on all classes of products. Matthews Champion Type Holders—for flat and convex surfaces—with interchangeable Steel Type, save time and lower marking costs. Matthews Inspection Hammers of best Pittsburgh Steel, are fashioned with the "know how" of over 50 years' experience.

Booklet "For Light and Heavy Marking" sent on request.
Write for a copy of it.

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Jas. H. Matthews & Co.

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Steel Lettering Dies and Stamps



Reg. U.S. Pat. Office.

"METALWOOD"

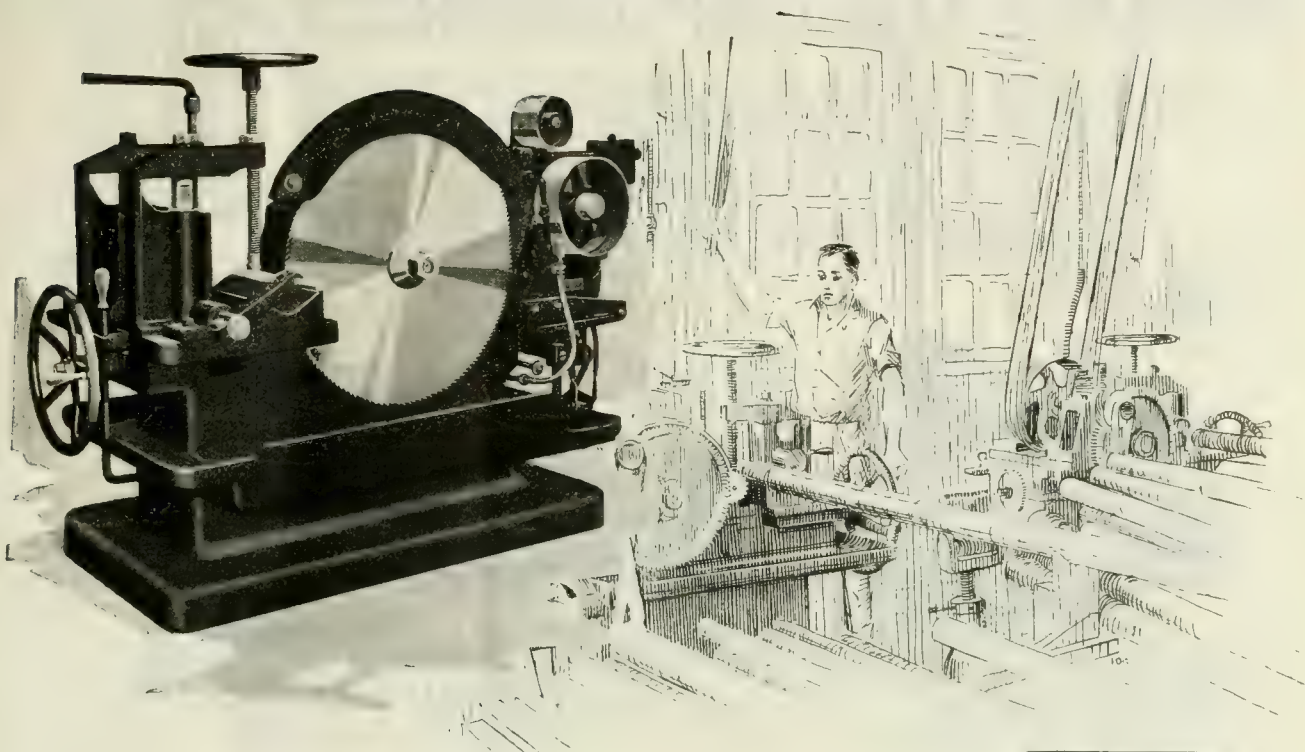
Hydraulic and Hydro-Pneumatic Quick Operating Presses for Straightening, Forcing and Broaching operations.

Hydraulic Accumulator Systems complete; Pumps, Valves, Forged Steel High Pressure Fittings, etc.

Metalwood Manufacturing Co. Detroit, Michigan

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Steel Economy

These machines
fully described
in Machine Tool
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No. 39 C

Got yours?

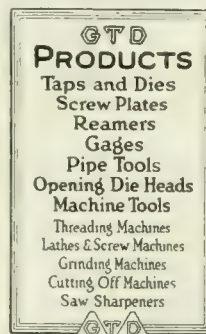
The use of Nutter & Barnes Automatic Metal Cutting-Off Saw Machines in the steel shed effect a real economy in steel.

These high-powered machines drive an exceptionally small, narrow saw, considering their capacity. Consequently the wastage of steel is reduced to a minimum.

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[MACHINE TOOL
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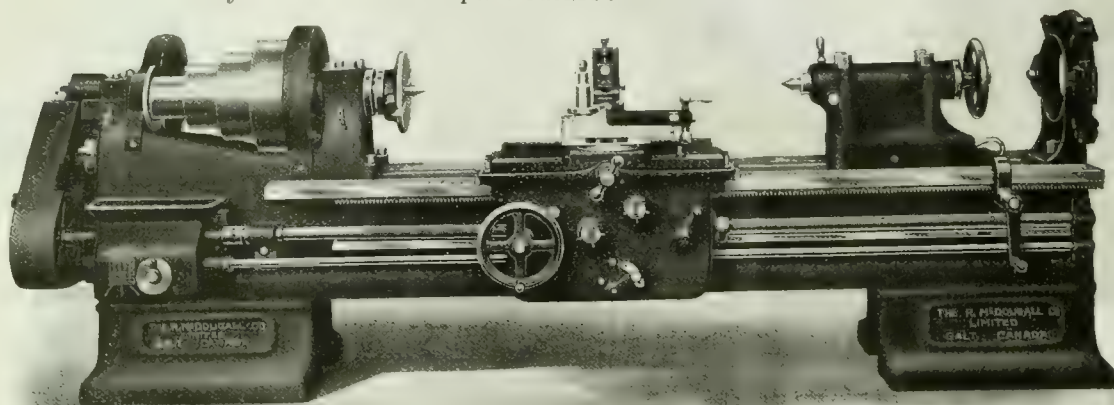
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BE SURE TO INVESTIGATE THE McDOUGALL GAP LATHE.

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P X H

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Because they are made in Canada by Canadian Capital and Canadian Labor.

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Because

"They Cut Faster and Wear Longer."

Ingersoll File Company, Limited

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"ASK YOUR JOBBER"

IMPERIAL

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Write for Booklet, "Better Factory Control."

GISHOLT MACHINE COMPANY

1162 East Washington Ave., Madison, Wis., U. S. A.

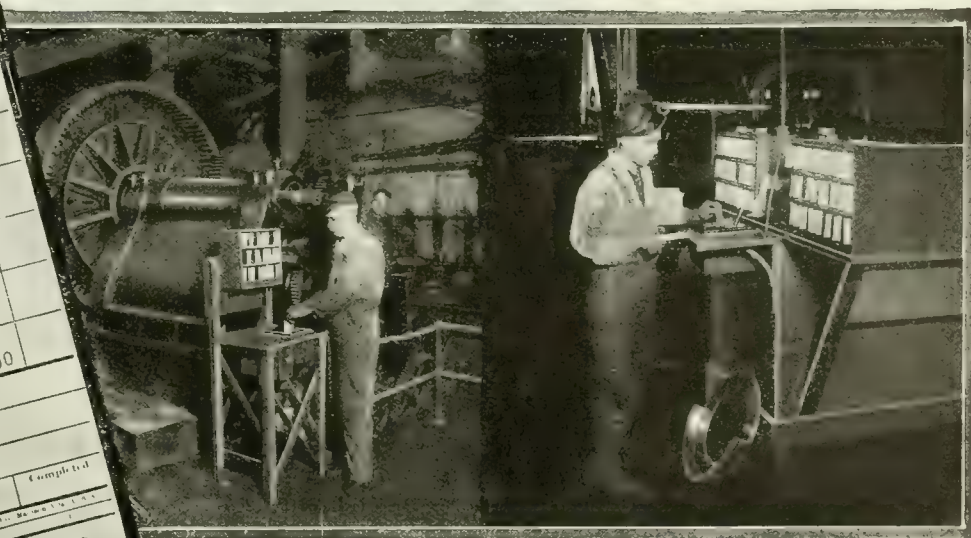
Builders of Standard and Automatic Turret Lathes, Vertical and Horizontal Boring Mills, Tool Grinders, Small Tools, Special Machinery, etc.

Eastern Sales Office: 30 Church Street, New York

Works: Madison, Wis.; Warren, Pa.

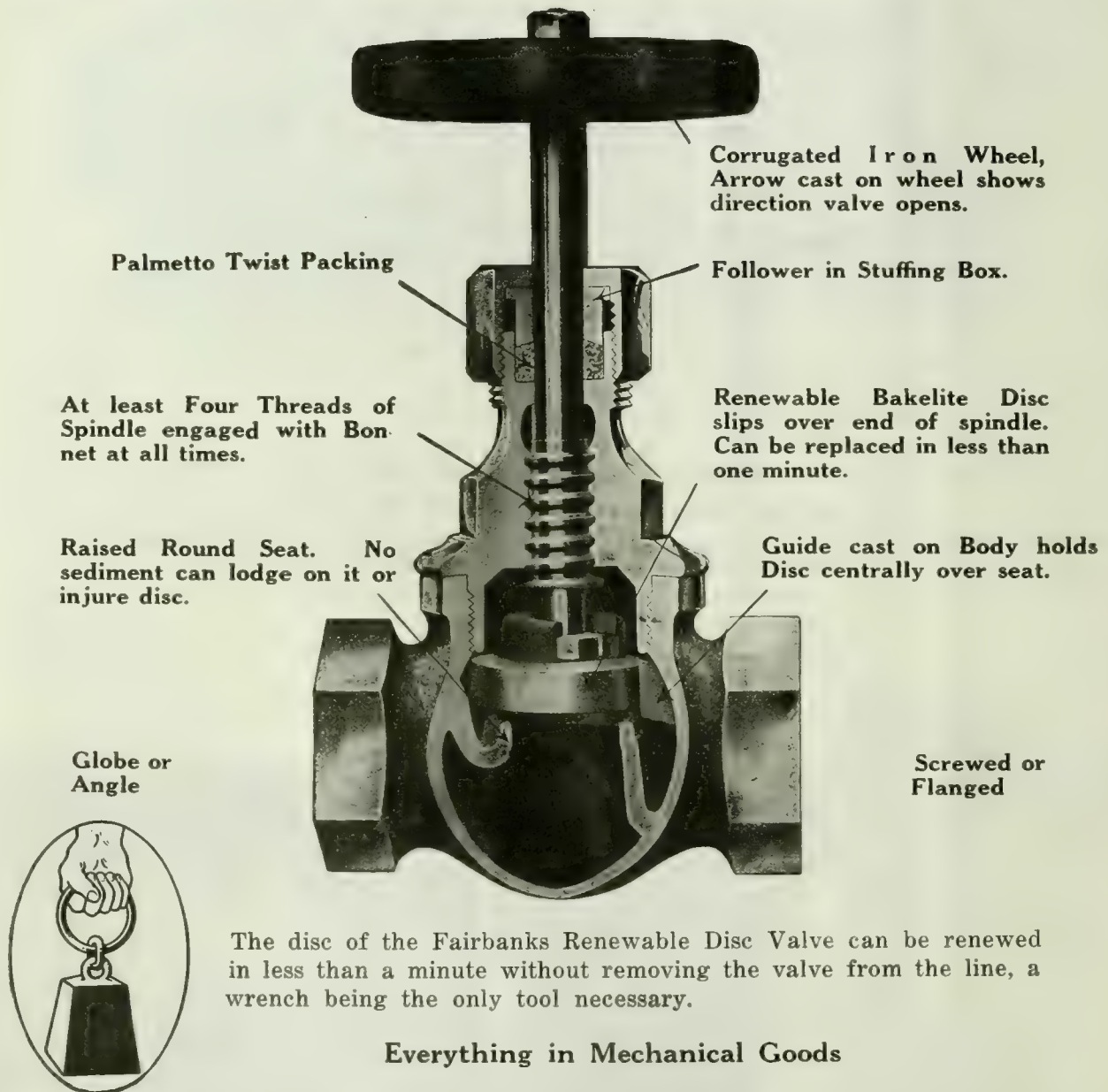
Agent: F. A. Thomas Co., San Francisco, Calif.

NO. 42	NAME <i>A. Jones</i>
Order No. 264	Operation <i>Drill</i>
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Rate	
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Fairbanks Renewable Disc Valves



The Canadian Fairbanks-Morse Co., Limited

"Canada's Departmental House for Mechanical Goods"

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CANADIAN MACHINERY AND MANUFACTURING NEWS

Volume XX, No. 9

February 27, 1919

Imagination and Sheet Metal Layout Work

Some Layout Methods For Making Complicated Shapes From Sheet Metal—The Geometrical Construction is Often Assisted by the Exercise of a Little Imagination

By F. SCRIBER

TO shape a part of solid stock is one thing, but when we have to cut from tin or other sheet metal a piece that, when bent into shape, will look just like it, we have an entirely different proposition and one that calls for more or less imaginative power. In presenting a few examples of this description it is hoped to help those not familiar with this class of work to see how some things look before bending and how to correctly lay them out either on paper or metal before cutting out to bend into shape.

On the accompanying illustrations the subject is shown in black heavy lines, while all construction lines are made light and extend beyond the subject except when they come on a centre line, when the centre line is shown in dot and dash and it is also used for a construction line.

Fig. 1 shows a rectangle, which needs no explanation as it is evident that all that is required is four sides, two 6 in. long by 4 in. wide, two 6 in. long by 2 in. wide, and two ends 2 in. by 4 in. arranged to bend as shown by the pattern,

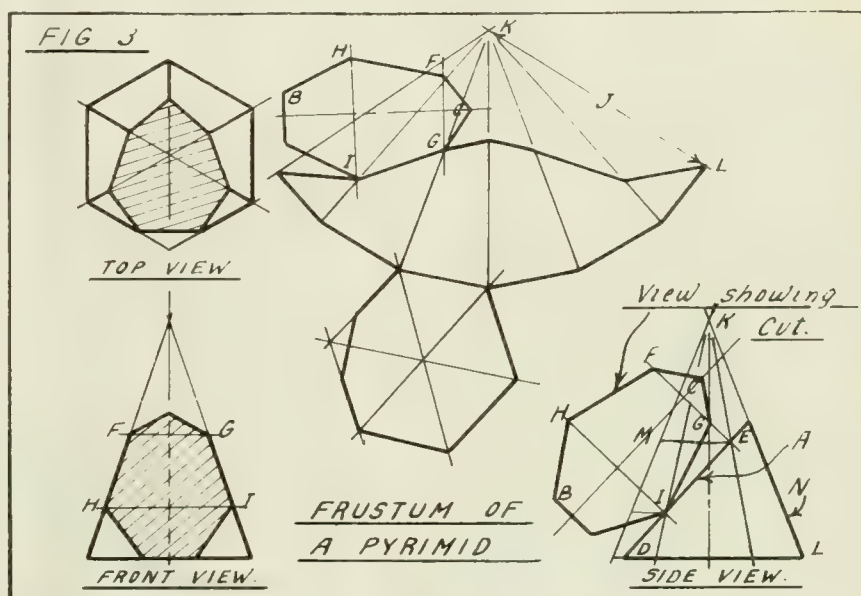


FIG. 3.

Fig. 2, this being the common layout of a cardboard box except that strips for pasting together are usually provided in such a layout.

In Fig. 3 we follow out the same principle, but it is more complicated. We first draw three views of the hexagon required, namely, front view, top view, and side view; we then cut off the hexagon to the line A, the next drawing required is obtained by drawing a view at right angles to the line A, the length B-C is equal to D-E, while the widths of this view are obtained from the front view, F-G and H-I respectively. Next with J as a radius draw an arc with a radius equal to K-L, and lay off on this arc six sides to represent the hexagonal pyramid at its base. Now, by measuring the distance from the base of the pyramid to the line that it is to be cut off on, along the respective lines, and transferring these measurements to the view being developed, we get a number of points, which, when connected by lines, give the required shape to cut. In this operation care must be taken that

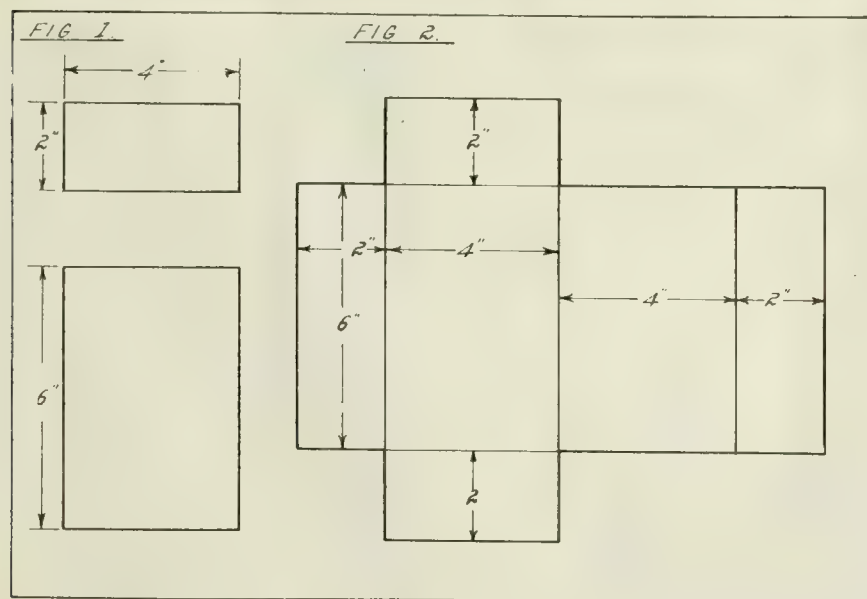


FIGURE 1

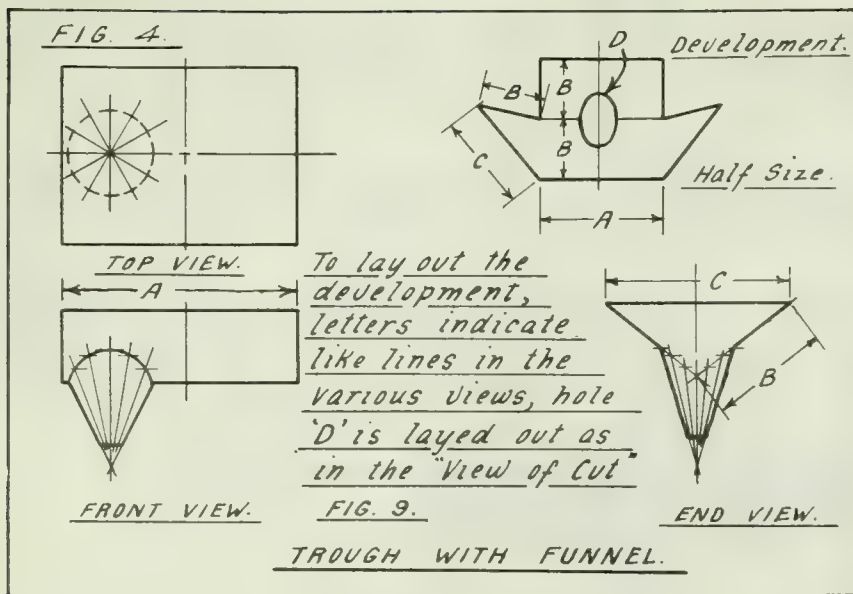


FIG. 4.

all measurements are made on the correct or true length lines, which are the lines that lay in the same horizontal plane and not the lines that slant towards or away from you, and in the side view they are M and N; to get the length of the other lines (the lines that slant towards or away from you) it is necessary to draw lines parallel to the base, from where the lines desired intersect with the line of the cut to the true length lines as shown by the construction lines.

As will be evident, the lines at the top of the figure being developed will be equal in length to the corresponding line of the correct view of the cut and are placed in position as shown, while the base is the hexagon which we have in the top view, and after drawing these in place we can cut out the entire developed view in heavy lines and fold, when we get a frustum of a pyramid, which looks like the drawing from various positions.

Figure 4 shows a trough with a funnel at one end, and is made out of two

sides and two ends by bending as shown. The funnel is made as described at the bottom of the illustration, which method is similar to the method described for a cone.

Figure 5 shows a boiler and dome which are cylindrical in shape; here it is necessary to get the shape of the cuts where the two parts intersect. This is obtained by dividing the circles in both cylinders into any number of parts that will give the required degree of accuracy (in the example shown, twelve), and by referring to the numbers in the various views and finding numbers in the other views for the large cylinder and letters for the small cylinder, the method of procedure used for developing can be followed with the help of the notes on the data sheet.

Fig. 6 is one of the most difficult examples shown; it is a frustum of a hexagonal pyramid tipped at an angle and true length lines which are absolutely necessary in development are located by a roundabout method. First draw

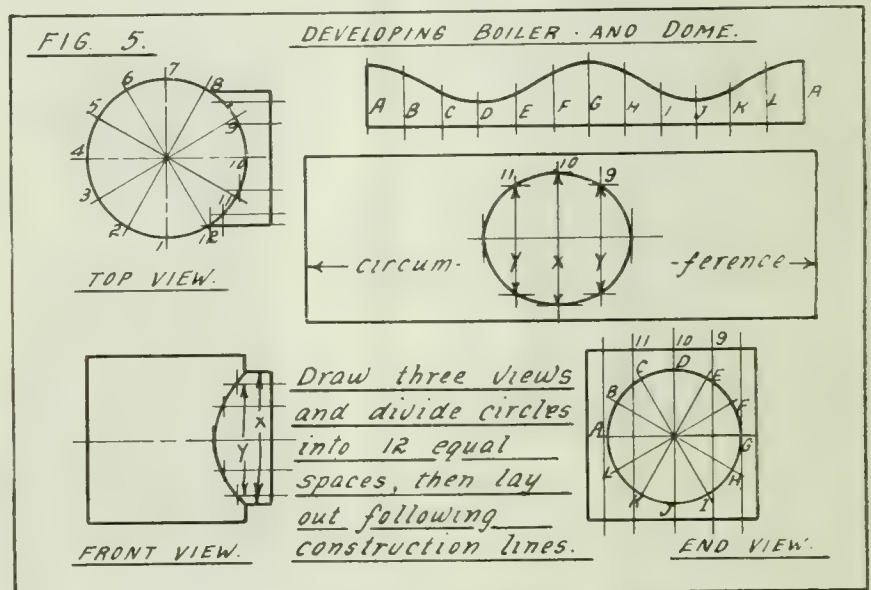


FIG. 5—DEVELOPING BOILER AND DOME.

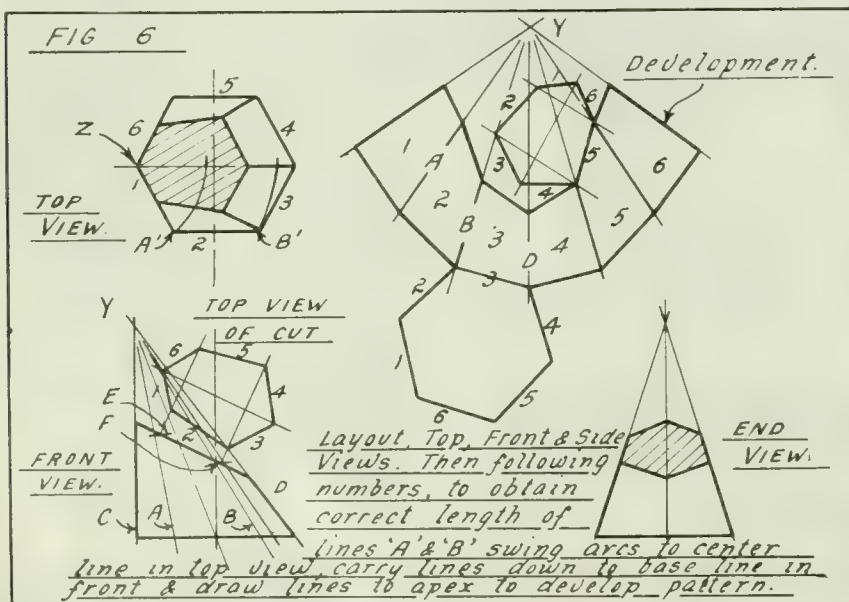


FIG. 6.

the top, front end views, then obtain a correct view of the cut as explained under Fig. 3; now owing to the fact that only the lines C and D run perpendicular to the eye they are the only lines that can be transferred directly from the front view to the pattern being developed and for convenience we will lay off from the centre Y the line D in the development, and as the length of the base lines are shown in the top view and are all equal in length, we draw an arc from the lower point on this line equal to the length of one side; next, to obtain the length of the line B with one leg of the dividers at the centre Z swing an arc from the corner B' to the centre line, which is equivalent to turning the model round and bringing the line B to a position perpendicular to the eye. Now project down from where the arc intersects with the centre line to the base of the pyramid and from there draw a line to the centre Y. This line will be the true length, and measuring from the centre Y and transferring this to the

development, where an arc drawn with this radius intersects with the arc previously drawn is the point to which the line B is connected. To obtain line A, follow out this same method of procedure as indicated by the construction lines. The line C can be taken direct from the front view and transferred like the others while the length of the lines, where cut off, may be taken direct in the case of C and D, while the measurements for lines A and B are obtained by running short lines E and F over to the construction lines and measuring along the construction lines to the intersecting points.

In this description we have dealt with one half only, but it will be apparent that the other or back half, being directly behind the front will be like it, and is drawn in the same manner. The base of the pattern is the hexagon shown in the top view transferred to the position shown. Now, to get the view which represents the cut-off, we draw a horizontal line from the point where the line

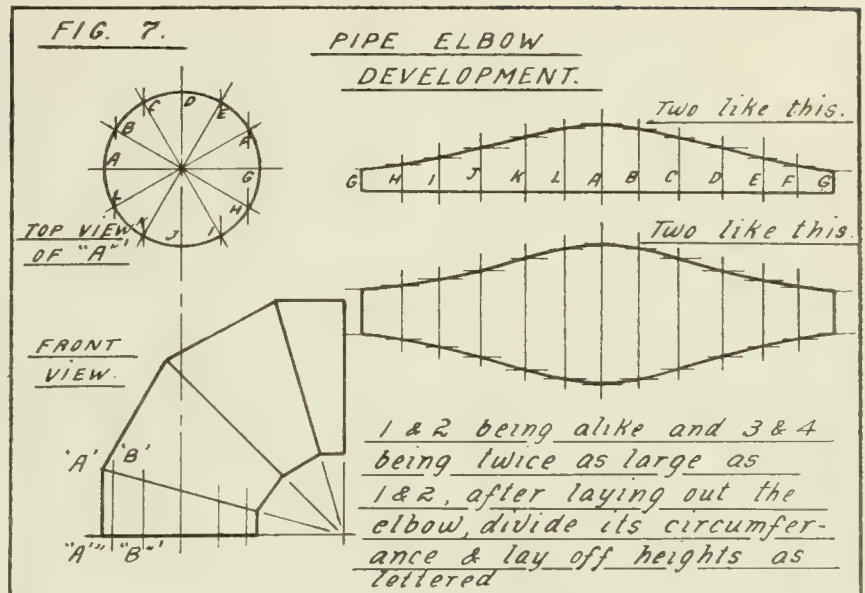


FIG. 7—PIPE ELBOW DEVELOPMENT.

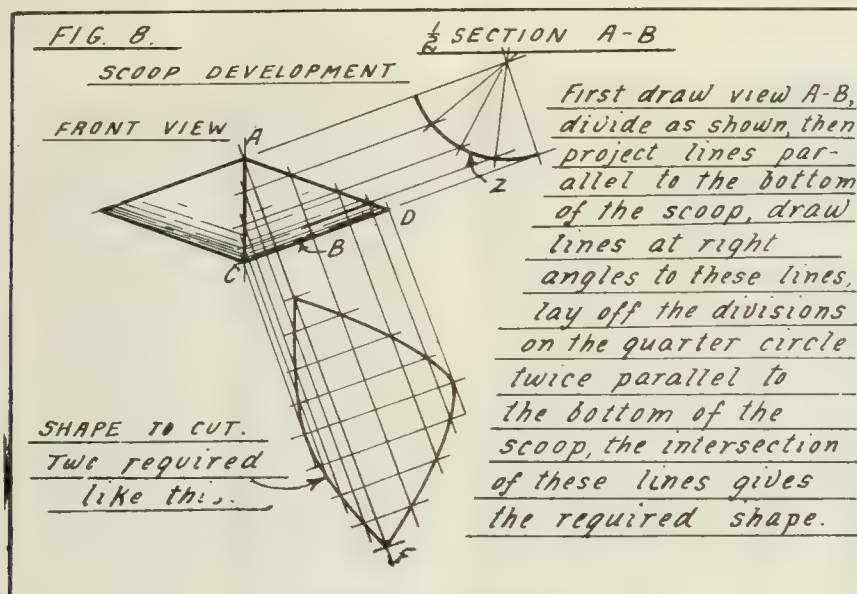


FIG. 8—SCOOP DEVELOPMENT.

as large as the upper, laying this off on both sides of the line gives the shape of the lower piece. Two of each shape bent will make an elbow of the type shown, which is a common stove pipe elbow.

Figure 8 shows a scoop similar to those used on scales. First draw a front view of the scoop, then the quarter circle Z, which is a view taken at the line A to B; divide this quarter circle into four or more parts and project to line C-A as shown; now at right angles to line A-B draw lines to intersect with the lines just drawn on line C-A and A-D; next, on line A to F draw eight spaces equal to the spaces in the quarter circle measured on the arc, then draw lines parallel to the line C-D; where these lines intersect with the lines drawn from points on the lines A-C and A-D draw curves as shown, and by cutting two pieces of this shape we can make the scoop by soldering them together.

Figure 9 shows a method for develop-

of the hexagon intersects with the cut over to the true length line and measuring either the distance from the bottom up or the centre down on the line which corresponds to it on the pattern, and connecting the points thus obtained by straight lines we get the shape of the top. To cover the top it is therefore only necessary to transfer the view of the cut to the position shown at the top of the pattern.

An elbow made up of cylinders, cut so as to make an offset connection and the method used for laying out is shown by Fig. 7. First divide the circle or plan view into a number of parts equally spaced (twelve in this case) and from the points on the circle project down to the front view as shown, next lay off on a straight line twelve parts which correspond to the circumference of the circle, and starting with the centre line lay-off the heights A to A¹, B to B¹, etc.; these points we connect with a curved line, and as the lower piece is twice

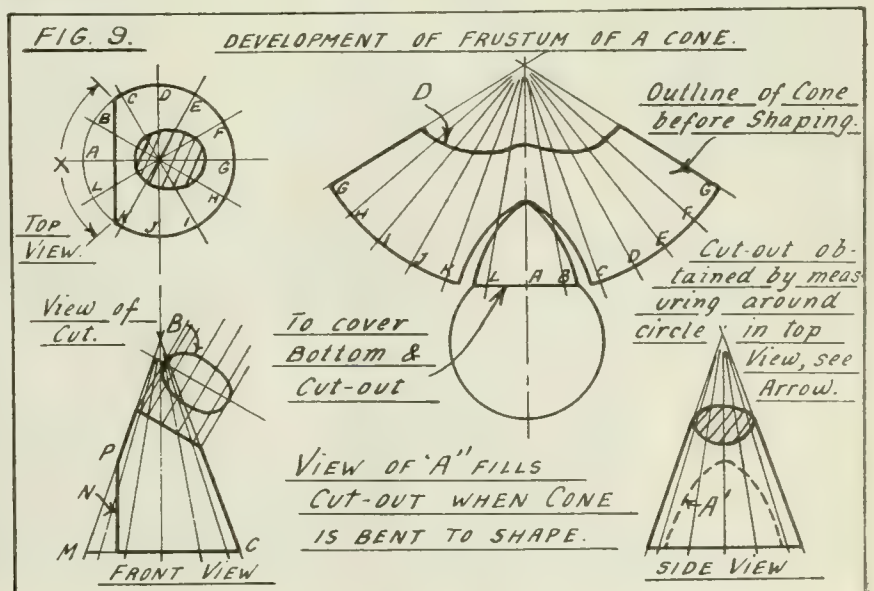


FIG. 9—DEVELOPMENT OF FRUSTUM OF A CONE.

ing a frustum of a cone; first draw three views of the cone, next divide the circle and project down to the base as described for Fig. 7, and from these points in the base draw lines to the apex; to get pattern, with compass set to radius B-C, draw an arc and lay off on this arc twelve spaces equal to the spaces in the circle; now, to get the shape of line D we follow the order of numbering in the various views and measure up from the base lines. As can be seen, we draw a straight line from where the point to be measured intersects with the cut to the outside lines, which are the only true length lines, all the others being lines which slope either towards or away from the eye, and for that reason are not seen in their true length. Now, to get the shape of the cut-out A', lay off the distance X on the arc of the pattern, half each side of the centre, and from the front view transfer M to N and M to P; these are connected with a curved line which marks the shape to cut and to

ference of the largest circle or the top of the hod; now from these points draw lines to the apex C; next where the arcs and the lines last drawn intersect draw a curve which is the shape of the top or curved line of the hod before bending. The base of the hod is a circle equal to the small diameter, although it is usually made with a flange on it.

Although these methods are somewhat laborious and require considerable care to lay out correctly, and oftentime the cut and try method fills the bill where the general outline is known, nevertheless they give an insight into development, and will be found valuable for laying out templates.

Whenever joints are to be made up by soldering, rolling the edges or other means, proper allowance must of course be made for this in the pattern or layout of the work, and various applications of the principles employed in laying out these parts will readily suggest themselves to the man up against it.

is difficult to find suitable posts, unless an employer has as many foremen as workmen, which is scarcely a tenable proposition. The only thing to do is to give them work on which they cannot go wrong, usually a very difficult matter, even when the work's equipment is mostly automatic machines, and as these men cannot use hand tools, the difficulty increases. Further, the cost of production is largely increased where inefficient workers are employed, and unless a drastic system of selection is adopted and this class of worker gradually discharged, failure must inevitably result. With trained men, it will be found that their previous employment may have been so different to what is required of them that new training is practically necessary, as, for instance, a man who has been employed in a pipe foundry and can mold pipes with the best workers, is of very little use doing light engineering castings in a jobbing foundry, and he is at a loss for some time, although he will soon make good if he likes, more particularly on the heavier parts of the work, but time must be allowed for the change. The same thing occurs throughout all kinds of work, and it follows that a little care in selecting the work for the men, regard being paid to their previous work, will help materially to solve the problem. A man who has been engaged in a locomotive shop on a big wheel lathe, is scarcely fitted to deal with small electrical work right away, but he may be a very good and efficient metal turner on heavy work. A little careful selection in placing workers on jobs for which they are best suited assists both employer and workman, because more work is got out of the machinery, and more money earned by the men, and at the same time this discrimination tends to promote a good general feeling.

There are sure to be some slackers in all large factories, but where the workmen are sorted out according to their skill, and the foremen and charge hands get a share of the profits in the shape of production bonuses, these slackers gradually disappear, and it is wonderful what few defects the machinery develops, though repairs have still to be effected.

If an employer can increase his output from his existing machinery, without increasing the cost per article produced, the profits can be materially increased, and wages will increase automatically, and when this happens an employer can rest assured that his workpeople are being placed to the best advantage in regard to both work and wage earning, no matter which particular member of the executive or staff does the actual sorting out of the workmen.

It is very desirable that all applicants should be asked full details of the work they have been previously on and their length of service, and that their records should be kept up carefully week by week, until they finally leave the service of the employers with whom they are "dilutees."—M. M.

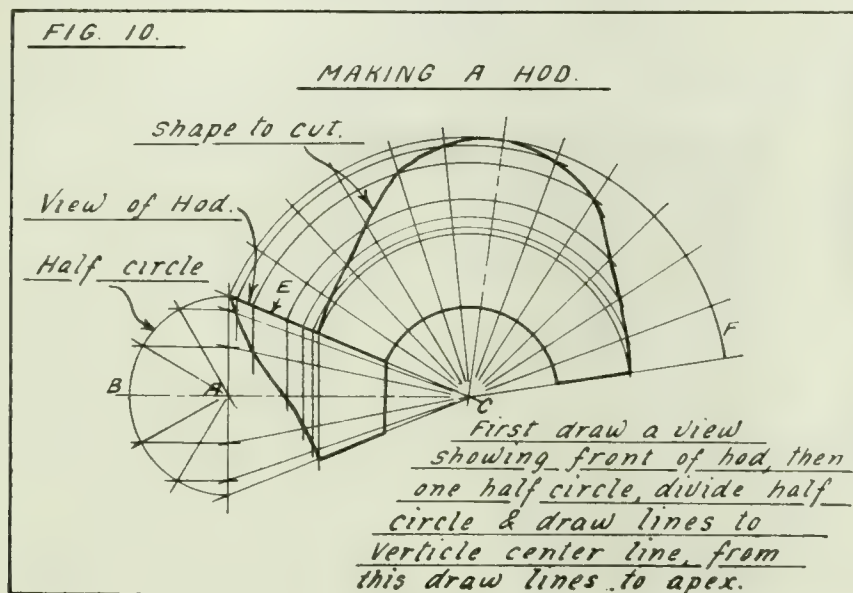


FIG. 10.—MAKING A HOD.

cover this space when the frustum of the cone is bent to shape we transfer the dotted view in the side view to the pattern as shown. This makes 2 curved lines, one a little smaller than the other, and if there is any doubt about being able to cover the hole with less than is taken out, it is well to remember that the cut-out is measured on the arc, while the piece to cover it is the cordal measurement or a straight line between the two points on the arc. To cover the top we draw a plan view at right angles to the cut as in the previous examples.

In the next example, Fig. 10, we have a coal hod. First draw a view of the hod and a semi-circle with a radius equal to A to B, divide this semi-circle into six equal parts, project from these points to the centre line and from there to the apex C from where the lines last drawn intersect with the curved line representing the open end of the hod, project over to the outside line of the hod E and with one leg of the compass at the apex C draw the long arcs shown; next on the arc F lay off twelve spaces equal to what would be the circum-

ADJUSTING WORK TO THE WORKMAN

In the days of "dilution" and substitution employers were given a number of workers whose only previous acquaintance with mechanical work had been gained at the desk, or in a shop of some kind, where goods were retailed. These conditions are likely to continue, and it is often very difficult to find a job for them, even under the supervision of a skilled worker. Some of the workers have sufficient common sense to really learn how to do a few things well, and on these particular jobs they earn very good wages when the payment is by piece-work, the really unskilled man in many cases having drawn more at the end of the week than the foreman, who is a highly skilled worker. Where the employer gets this type of workman, he can usually put him on to a similar job and the man will soon earn good wages; but whilst this class of worker will cause little trouble, more often than not the "dilutees" were men who knew better than their instructors, and for these it

Gravity Carriers and Electrical Conveyors

Some Instances Where the Installing of Conveying Systems Resulted in a Considerable Saving in the Cost of Shop Transportation—The Gravity Conveyor is One of the Cheapest Forms of Conveyor to Operate

By F. C. PERKINS

A DECADE ago little was known of the tremendous possibilities back of the idea of utilizing a natural force such as gravity as a means of conveying merchandise from point to point in and about factory plants. To-day it is a recognized element in factory and warehouse economy, its development has been rapid, and scientific, practical men in all lines of manufacturing recognized its value the moment it was brought to their attention, recognized that its chief merits lay in economy of labor and time, the two great essentials in profitable manufacturing. The accompanying illustrations show some of the

applications of the force of gravity for conveying materials and finished products about various manufacturing plants and yards.

As shown in photograph, Fig. 1, there is in operation at the mammoth building occupied by Morris, Kansas City, an open gravity 78-foot spiral chute running from seventh floor to the basement. This chute will carry merchandise of every description, and packages varying in weight from eight ounces up to and including several hundred pounds. The spiral passes down through the loading dock to the cars. It has a capacity of

150,000 lbs. of packed meats per day of 8 hours.

The details of construction of an 8 ft. section of gravity roll carrier developed at Merriam Park, St. Paul, Minn., may be noted in drawing, Fig. 2, while the photograph, Fig. 3, shows a carrier handling cement in sacks. The photograph, Fig. 4, indicates the method of handling shingles by the Palmer Lumber Co.

The illustrations, Figs. 5 and 6, indicate the use of a double roller lumber carrier handling cooperage stock at the works of St. Louis Cooperage Co., the form photograph showing a gravity car-

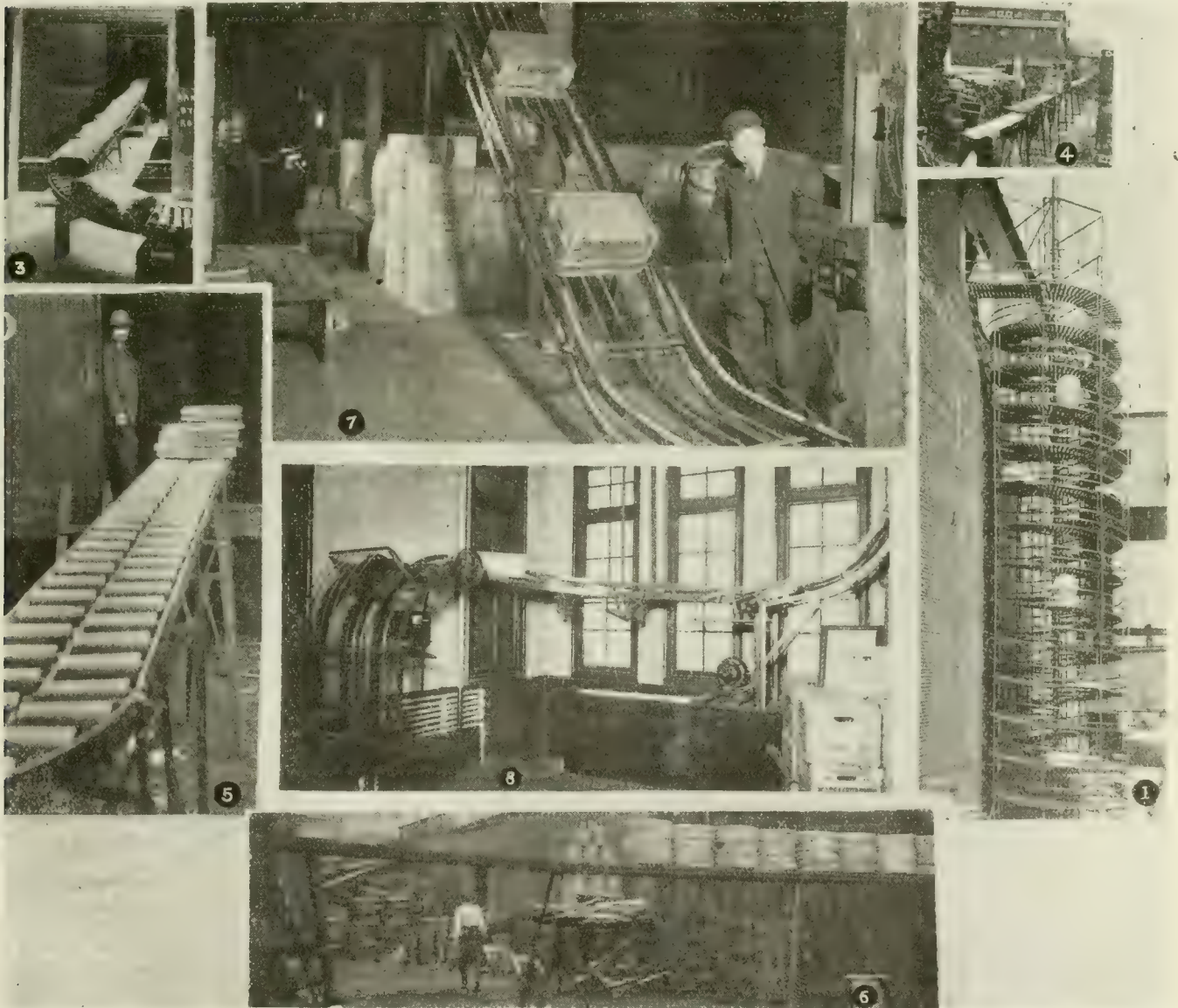


FIG. 1—78 FT. SPIRAL WHICH PASSES THROUGH LOADING DOCK ROOF TO CARS, CAPACITY 150,000 LBS. OF PACKED MEATS PER DAY OF EIGHT HOURS. FIG. 2.—GRAVITY CARRIER HANDLING BAGS OF CEMENT. FIG. 3.—HANDLING SHINGLES BY GRAVITY CARRIER. FIG. 4.—LUMBER CARRIER 8 IN. CENTRE OUTSIDE RAIL, EXTENDING FROM DOOR TO PILE. FIG. 5.—DOUBLE ROLLER CARRIER HANDLING COOPERAGE STOCK AT THE PLANT OF THE ST. LOUIS COOPERAGE CO., ST. LOUIS, MISS. FIG. 6.—INCINED ELEVATOR ELEVATING BOXES TO OVERHEAD RUN. FIG. 7.—TOP OF SPECIAL ELEVATOR.

rier of 8 in. centre outside rail extending from the car door to the storage pile.

The handling of brick, cement blocks and tiling, by hand or wheelbarrows, is not only a slow and expensive method, but involves hard and tiring labor. By

even in absolutely irrespirable air to the exclusion of the more cumbersome mine rescue breathing apparatus. This erroneous belief will no doubt be further confirmed by millions of discharged soldiers who have been trained in the use

men will wear continuously is yet to be devised. On account of the urgent need of such a device for safeguarding the health of workmen in the mining and metallurgical industries, the Bureau of Mines has undertaken a study of dust respirators with a view to seeing that as satisfactory a model as possible is available to these industries.

Army Gas Mask

The army gas mask consists of a face piece of rubber and cloth fabric, containing eye pieces and connected by means of a flexible rubber tube to a canister containing charcoal and soda-lime for filtering out the poisonous gas from the inhaled air. The canister is supported in a knapsack slung from the neck.

The army gas mask is by no means the unusual protective appliance that it is popularly believed. It does not afford universal protection against all gases, nor can it ever be used safely in low oxygen atmospheres. It furnishes no oxygen to the wearer and can only remove comparatively small percentages of poisonous gas from inhaled air, usually less than 1 or 2 per cent. Higher percentages will immediately penetrate the canister and "gas" the wearer. The standard army gas mask will furnish protection against percentages not exceeding two per cent. of the following gases in air: Sulphur dioxide, hydrogen sulphide, chlorine, carbon bisulphide, nitrogen peroxide, aniline vapor, benzyl bromide, benzyl chloride, chloracetone, chlorpicrin, hydrogen chloride, phosgene, sulphur chlorides, xylol bromide, stannic chloride, titanium tetrachloride, and silicon tetrachloride.

It will be seen from the above that the field of usefulness of the army mask is confined to certain of the chemical industries, around smelters and roasters, where sulphur fumes are given off and in the industries using chlorine and bleaching powder. The army canister also contains cotton filter pads, which remove irritating and poisonous dusts, which increases its usefulness around smelters where sulphur and arsenic fumes must be removed.

The army mask furnishes, no protection whatever against carbon monoxide. This is the poisonous constituent of blast furnace, producer and illuminating gases, and of mine gases after fires and explosions in coal mines. Carbon monoxide is also likely to be present in ordinary fire-fighting conditions met by fire departments. Moreover, in all of these cases there is likely to be a deficiency of oxygen. Therefore, for adequate protection against these conditions the oxygen-breathing apparatus must be used, and reliance on the army mask may be fatal.

The Bureau of Mines is working on a carbon monoxide mask and hopes to develop one that may be used in the future for low concentrations of this gas, but such a mask is not now available.

Ammonia is another gas that will penetrate the standard army canister. However, a special chemical may be placed in the army canister which will

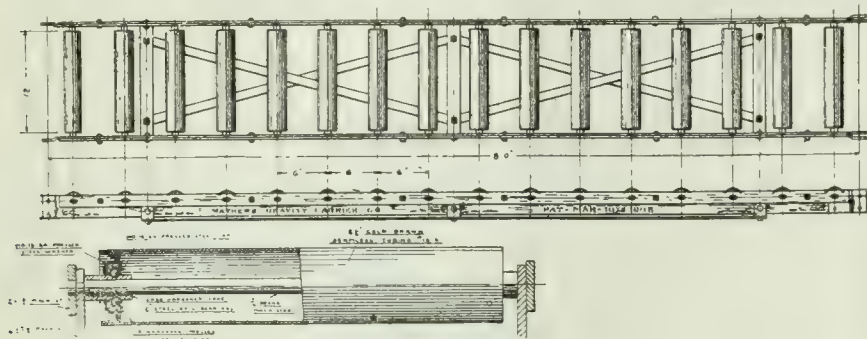


FIG. 2.—ROLLER DETAIL, GRAVITY CARRIER.

introducing the gravity brick carriers and automatic elevators a problem, has been solved which has proven a boon to manufacturers, furnishing a device on which brick, cement blocks, tiling, and other merchandise will travel by their own weight any desired distance on a four per cent. grade.

The many advantages of this equipment will at once become apparent to all, chief of which is the elimination of great labor expense. The gravity carrier does not cost a cent to operate, as its power is natural gravity. Two men, one at each end of the carrier system, will do the work of from four to six wheelers, and in considerable less time. Brick will travel around single or reverse curves the same as on a straight carrier without danger of falling off, and delicate faced or fancy brick and tiling are conveyed just as quickly and safely as common brick. The carriers are made of solid steel in four and eight foot lengths, coupled together. The brick travelled over cold rolled seamless steel rollers, 2½ in. in diameter, in widths varying from ten to sixteen inches. These rollers are ball bearings and flanged at each end to prevent brick from falling off.

In many cases an inclinable automatic elevator is used in conjunction with the gravity carrier as seen in illustrations, Figs. 7 and 8, at the plant of the Massachusetts Brewers Co. at Boston, Mass. The former shows an inclinable elevating boxes to an overhead run, while the latter illustration shows the top of a special elevator arranged so that the boxes continue on around the wall and up to another inclinable elevator.

INDUSTRIAL USE OF GAS MASKS

During the last year the Bureau of Mines, Department of Interior, Washington, has received many inquiries regarding the use of army gas masks in the industries for protection against poisonous and irritating gases. These inquiries show a general belief on the part of the public that this type of mask will protect the wearer under all conditions against any gas whatsoever, of the gas mask and have been taught

that it gives them absolute protection against all gases used in warfare or likely to be used. These men will not realize that out in the open air of the battlefield the percentage of gas in the air can never be anywhere near as large as may occur in the confined spaces of a factory operation. A mask may afford complete protection under outdoor conditions, and break down at once when used indoors where a gas container has burst and filled the room with a greater concentration of gas. It must also be remembered that the absorbents in the army respirator, which filter out the poisonous gas are specially designed for the gases used in warfare, and as a matter of fact do not protect against the more common industrial gases as, for example, illuminating, natural, producer and blast furnace gas.

The army gas mask never should be used in mines because of the uncertainty there is of the kinds and amounts of gases in the atmosphere and liability of insufficient oxygen to support life.

In view of these limitations of the army gas mask, which, if not realized, will lead to serious accidents and fatalities, the Bureau of Mines is issuing this brief statement of the industrial use and limitations of the several dust respirators, gas masks, and oxygen breathing apparatus.

Dust Respirators

Protection from dust and liquid mists is obtained by the use of a simple dust respirator, which removes these particles by means of a filter of moist sponge, cotton, or wool pad, porous paper, or even a very fine mesh metallic gauze. The respirator may enclose the mouth and nose only, or it may be combined with a face mask containing eye pieces if the eyes also must be protected. The simple "pig snout" respirator, containing a moist sponge, has been on the market for years. It is highly uncomfortable to wear, rather insufficient for removing fine dust, and most workmen prefer to tie a large handkerchief over their nose and mouth. Some improvement has been made in recent years, but on the whole a really efficient and comfortable dust respirator that work-

adapt it for use around refrigerating plants.

Oxygen-Breathing Apparatus

The self-contained oxygen-breathing apparatus can never be displaced by the gas mask for use in atmospheres deficient in oxygen. Such atmospheres are encountered in mine rescue work, in gas mains, blast furnace stoves, gasoline tanks, etc. Aside from the lack of oxygen, carbon monoxide is also present, for protection against which the army mask is useless.

The oxygen-breathing apparatus must also be used instead of the army gas mask wherever there are large quantities of irrespirable or poisonous gases, as for example, in entering a gasoline tank containing some residual liquid, or similar tanks, towers, and other closed spaces. The concentration of vapors produced by volatile liquids in closed containers is too high to be entirely removed by gas mask absorbents. The only recourse in such cases is a self-contained appliance in which the wearer does not breathe any of the irrespirable atmosphere.

Importance of Expert Advice on Protective Breathing Appliances

Owing to the many factors entering into the use of protective respiratory appliances the importance of competent advice on the selection and use of such appliances cannot be over-estimated. The fact that the army and navy used gas masks has been widely disseminated, and its significance is likely to be misunderstood, especially by men who have had some training in their use. It also should be made known that both the army and navy used the oxygen-breathing apparatus in its appropriate place.

In connection with the Bureau of Mines work of safeguarding the health of miners and workmen in the metallurgical industries, a general investigation of respirators, gas masks and breathing appliances is being undertaken at the Pittsburgh Experiment Station of the Bureau. This research will be conducted by experienced chemists and engineers who had charge of gas mask research in the Bureau's war gas investigations and subsequently in the Research Division of the Chemical Warfare Service, U.S.A.

The industrial respirator investigation will include:

(1) Advice on the suitability of the standard army gas mask for use in various industrial gases.

(2) Approval of industrial gas masks and respirators, when properly submitted to the Bureau by the manufacturer in accordance with a schedule to be announced later.

(3) Instruction of workmen at plants in the use of masks and respirators in a manner similar to that now being given by the Bureau in the use of oxygen-breathing apparatus.

WOOD FLOORS

Wood block floors for factory work were introduced into Great Britain some time ago, but for some reason they have not come so largely into use in engineering shops as was at one time anticipated. The first cost of wood block construction is higher than when certain other materials are used, but on the other hand maintenance cost is almost negligible by comparison by reason of its great durability. It makes many economies in plant operation possible, and after the war there is little doubt that creosoted wood block floors for heavy service will be the rule rather than the exception.

It has been pointed out that the resistance of wood block floors is astonishing. Careful study of the question has shown that under extremely heavy loads and stress of traffic the ends of the wood fibres form a surface that grows harder and more compact with use; the exceptions are when either the blocks have been loosely fitted or the interstices have been left or of large size, and filled with some material which has crumbled away. Where the blocks have been closely packed, hardly any wear is perceptible even in such places as machine tool shops, where the conditions are far from ideal for any kind of flooring. It is admitted that a wood block floor is the easiest to repair should repairs or replacements be necessary. It is firm and hard enough to offer small rolling resistance, yet it never becomes slippery nor loses its resiliency. It absorbs vibration, is a non-conductor of heat and cold, is comparatively noiseless, and does not originate dust, and is waterproof, decay proof, and vermin proof.

Engineers and steel workers will be interested to learn that wood block floors of the better kind resist high temperatures extraordinarily well, and char very slowly even when subjected directly to fire. As a matter of fact, what charring there is is mainly on the surface, and only after prolonged and excessive heating does the charring penetrate any distance into the flooring. When set on a concrete base a wood block floor is extremely difficult to burn. There have been instances in foundry operation of crucibles overturned and molten metal poured on the blocks, which afterwards showed but little damage. An instance is cited of a fire which completely destroyed a large structure in Philadelphia. The structural steel was twisted and warped, and after the wreckage was cleared away the creosoted wood floor was found to be practically undamaged except for a little surface charring. The blocks were taken up, scraped, cleaned, and relaid, and are still giving excellent satisfaction, a practical demonstration of their freedom from damage by fire.

It has been pointed out that a shop or factory floor with all these physical advantages must promote higher efficiency both as regards employees and mechanical equipment. Being free from both cold and dampness, noiseless and easily kept clean, the working conditions are improved. The absence of dust, and the distinctly antiseptic nature of the creosote preservative employed are real

factors in securing better health amongst the workmen.

Tests have shown that, owing to the particularly resilient nature of its surface a wood block floor is comfortable to work on, and the employees are spared much of the fatigue attributable to floors composed of harder materials. This characteristic also helps to keep tools from being blunted or castings broken that may be allowed to fall. The absence of dust saves bearings and other delicate parts of expensive machines from injury. Truck labor is greatly reduced, and also the accident hazard is low with a floor that is unbroken, is even, and unpatched, and that never becomes slippery.

The absorption of vibration is another valuable point in favor of wood block floors as it enables greater accuracy to be obtained in the operation of precision tools. Again the use of such small units as wood blocks makes it a simple matter to take up any section of the floor to put down pipes, conduits, or rails, or the foundations of heavy machinery, and to relay it again quickly without any alteration of the floor level. Light machinery can be bolted down directly to the blocks by coach screws, perfect stability being ensured by the strength of the binding material employed. Long-leaf yellow pine has been selected for the better grades of wood block flooring for the reason that on the authority of the American Railway Engineering Association it exerts the greatest resistance to end compression because of the extreme density of its fibre and high proportion of "summerwood," in which short leaf pine is deficient.

Wood block floors must be all sound, square-edged, free from bark and loose or rotten knots, or any other defects detrimental to their strength or durability. The timber should be properly air-dried in order to ensure a rapid, thorough penetration of the wood cells in the creosoting process.

Mention may be made of the fact that a certain manufacturer of wood block floors originated the use of empty cell, specially treated block for floor construction, and the results obtained with these floors are said to bear witness that this is the proper method. Blocks so formed show a minimum of shrinkage when installed in a floor. The creosote used in this process is a pure dead oil, which is a distillate of coke oven tar, and is a product only obtainable by such distillation. It is entirely free from admixture of tar, tar oils, petroleum, or any other product, and in preparation sufficient pressure is used to secure complete penetration. This process in no way reduces the compressive strength of the wood, but it renders it proof against decay, and enables it to resist the action of any oils, acids, or alkalis that may come into contact with it.

It has been announced that E. W. Beatty, K.C., president of the C.P.R., has accepted the position of chancellor of Queen's University, in succession to the late Dr. Jas. Douglas, of New York. Mr. Beatty has the honor to be the third chancellor of Queen's since 1878.

The Rapid Production of Test Pieces

While Descriptive of the Making of Test Pieces From Shell, the Article is Applicable to Similar Work in Any Machine Shop—
How Rejects Are Eliminated

By TYKE

DURING the past four years millions of shells have been made, and, as a natural sequence, the manufacture of these has led to writing of many articles, all written, no doubt, with an earnest desire to further the Allied

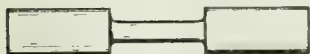


FIG. 1



FIG. 2

cause by making suggestions, describing a new tool or method of procedure, or relating an experience whereby a material increase had been made in production.

During this time, little, if anything, has been written about the less pretentious test piece, though these have played quite an important part, and had the peculiar distinction of having to be finished on time, otherwise there would have been a very serious delay and consequent trouble, owing to the fact that a whole series of shells would have been held up until the test pieces had been completed and proved.

Owing to this peculiar circumstance, many schemes had to be employed, some of which proved to be first-class, some not so good, whilst others were no good at all.

The whole situation became so serious at one time, that it practically became a manufacturing proposition on a small scale.

The object of this article is, therefore,

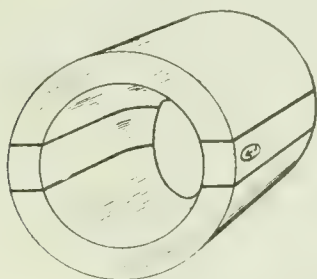


FIG. 3

not necessarily to tell how to make test pieces, so much as to show what can be done by careful thought and application plus good and thoughtful treatment to the help.

The six-inch test piece probably gave the most trouble on account of the large amount of metal to be removed, not to mention the cutting out, which gave any

amount of trouble and was responsible for more than one broken shaper, and this is the one we will consider.

After leaving the regular cutting-off machine, the portion left from which the test piece had to be cut was, in the early stages, around 8 inches long, and had to be turned the full length, as shown by Fig. 1. The first one to be turned, in one large shop not a thousand miles from Toronto, took slightly over four and a half hours. The reason for this apparent slow time was twofold; first, the mechanic to whom the job had been allotted felt a certain amount of undue responsibility, and was most anxious not to spoil it, but rather to make a first-class job of it. Secondly, no one in charge appeared to know exactly how good (or bad) a finish was necessary, the consequence being the ends were finished with as great care and with as good and accurate a finish as the centre portion—which of course was the only part that had to be really accurate. Due to the large numbers required as time went along, it was seen that a large saving in time could be brought about by making a change to the jaws of the testing machines. This was done, and in all subsequent test pieces the ends were left approximately square, as shown by Fig. 2, and were now required to be only 5½ inches long. Two pieces were required from each shell, and these had to be cut out diametrically opposite as shown by Fig. 3, care being taken not to destroy the Government stamp, which had to appear on each test piece accepted.

Cutting these out gave the most trouble, and various methods were adopted with varying success. The planer, equipped with two parting tools, gave very satisfactory results for a long time, but the parting tools proved to be a costly item when added to the labor cost. To say nothing of the expensive piece of machinery tied up whilst being used for this work. A much cheaper method was finally adopted and one that gave exceedingly satisfactory results in spite of the energetic opposition that it met with in the early stages.

This latter method was the simple adaptation of the power hack saw after a very slight change had been made. In ordinary times these machines held one saw only, but, by making a special holder they carried two saws and cut the test piece out the proper width at one clamping, and in exactly twenty-five minutes. The shell was then turned around in the vise and the opposite side cut. The holder can be clearly seen in Fig. 4. This was made of machinery steel, and when the saw was not being used on test pieces it was taken off and

the original holder replaced. These saws could easily dispose of from 18 to 20 shells each per day, and were amongst some four or five others that were attended to by one man, thus bringing the cost for operation down to something less than seven cents per machine per hour as compared to fifty or sixty cents for shaper or planer work, and not such a large output. The cost of the saws was not more than the cost of the parting tools, hence there was a very handsome saving from that source alone, in addition to which it relieved the other machines for more profitable work.

Since these pieces had to be cut from near the base end of the shell, it frequently happened that the end nearest the base was of a most irregular shape, due of course to the inside profile (see Fig. 3), and it was necessary, though not compulsory, to shape this end in order that the piece in question could

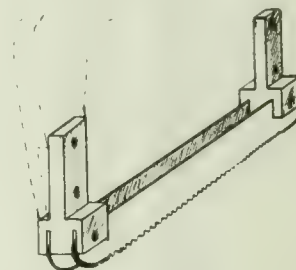


FIG. 4

more easily be handled in subsequent operations. This shaping was accomplished as shown by sketch Fig. 5, there being no great accuracy required beyond being careful not to bring them under size, which would have meant serious delay in getting another Government stamp on the remaining portion of the shell, and cutting another piece out of that.

After shaping, they were then centred on one end only, the other end being caught in the chuck of the lathe as shown by Fig. 6. The next operation was to run a parting tool to within one-eighth of an inch of the finished size, Fig. 7, roughing down to within a thirty-second, then finishing and putting the radius in the corners with the one tool as shown by Fig. 8.

Remarkable as it may seem, centering, parting, roughing and finishing to within a thousandth part of an inch or so could be accomplished in less than twenty minutes, and has been done in a few seconds over fourteen minutes. When it is understood that the rough size of the test piece is approximately 1¼ in. x 1¼ in., and has to be turned down to .564 in. plus .002 in. and minus .003 in. for a distance of 2.400 in., it will

be freely admitted by those familiar with lathe work that it is very rapid work, and day work at that. Some firms handled their test pieces on a piece-work basis, but I doubt very much if they got them any cheaper, if as cheap as those done under the writer's supervision.

At one time a wave of carelessness

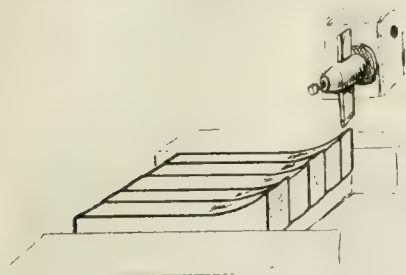


FIG. 5

swept over the shop, and in one week some four or five had been scrapped, for which no one would take the blame.

This state of affairs naturally led to careful investigation, and it was noticed that the mistakes were not the result of bad workmanship, neither were they the result of unsuitable tools or machines, but appeared to the writer to be the result of the job becoming more or less monotonous, and, such being the case, the time was ripe for some method of introducing a little incentive to do better and yet keep the goodwill of the men. Careful observation showed that in nearly every case the error in the turning was one of .025 in. or a thousandth or so over or under that figure, and very seldom one of, say .008 in. or .006 in. This led the writer to infer that it was the monotony of the job that was beginning to tell its story on a set of real good men—none better.

Others had it that it was just carelessness and nothing else. Whatever the cause, the remedy was exceedingly simple, and was, so the writer was informed recently, welcomed by most of the men, for the very good reason that it reduced the chances to a minimum of

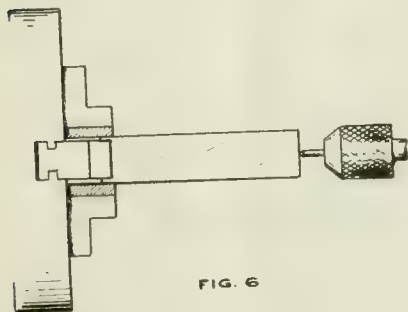


FIG. 6

any man being wrongly accused of making scrap.

It was stated that the error was in the neighborhood of .025 in., and this means that the micrometers had either been set wrongly in the first place, or else the thimble had moved, which is quite possible, but not very probable that it would move exactly one complete revolution. In any case, the remedy was absolutely

instantaneous, and since it was religiously kept up, the number of spoilt test pieces was, for many months, less than a half of one per cent. Fig. 9 shows clearly the remedy used, nothing more than a simple form of snap gauge, which was tried on every test piece before taking them from the lathe in which they were turned. This gauging was done in full view of the lathe hand, and it was therefore clearly seen by him that it was for his good as well as for the good of the cause in general.

As time went along, and as there were several apprentices in the shop, it was thought that this job could be handled by some of them to perfection, thus giving them a good start on simple turning, yet turning of a class that called for speed and a reasonable amount of accuracy. At first this looked as if it was going to turn out a failure, but by kindly encouraging the boys, and giving careful attention to the proper grinding of their tools, they were soon made to grasp the spirit of the thing, and in every case they were able to turn out test pieces as good as, and almost as quickly as the most experienced mechanic. Further, it

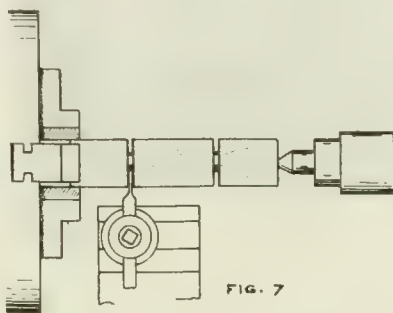


FIG. 7

was noticed that the number of scrap made by the boys was, after the first week or so, considerably less than that of the men, due, no doubt to their enthusiasm and their keenness to make good in their new capacity. It was carefully noticed that any scrap made by the men was in almost every case due to the aforementioned cause, micrometers wrongly set, and seldom due to bad workmanship. It will be readily seen that a large amount of monotony existed in this work for a good mechanic, nevertheless a great number were called upon to do it, and stuck to it like real men, for months at a time.

Before winding up this article it will be interesting to note that the record in this particular shop for a man was thirty-five tensile test pieces and five compressions in twelve hours. The compression test pieces, being $\frac{1}{2}$ in. diameter and $\frac{1}{2}$ in. long, parted to within 1-16 in. It will be seen that this averaged slightly over three an hour, or a little under twenty minutes apiece, which is a mighty good day's work. The record for a boy 18 years of age, was 20 tensile test pieces, all correct and well finished in twelve hours.

Whilst there is, perhaps, nothing new in this article, if the few figures help any apprentices to further effort, it will have done its part.

THE BRITISH ELECTRIC VEHICLE BOOM

Active preparations are being made in Great Britain for the production of every type of electric battery vehicle. Various firms which had been manufacturing in a small way before the war are extend-

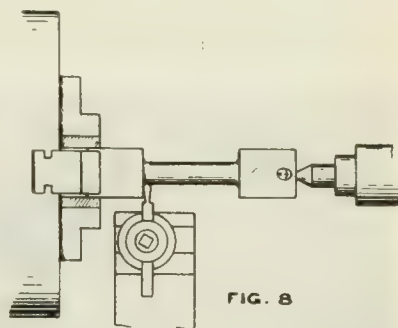


FIG. 8

ing their factories, and, it is now realized that battery propulsion has a field of its own, notably in refuse disposal and other municipal services, in general delivery work through city streets, and in factory transport by means of small trucks. The British motor manufacturers are holding a meeting at which the whole field will be carefully reviewed, so that one may expect to find famous names in the motor world associated with electric as well as petrol and other vehicles. Moreover, arrangements are being made for co-operation with British electrical manufacturers in the production of motors and control gear suitable for electric vehicles. The British electrical manufacturers are so well organized that they will be able without difficulty to select the firms best fitted for the economical manufacture of the electrical parts. The selected firms will concentrate in the work so as to get the benefit of mass production. The British battery makers have also by amalgamation and other developments, put themselves in a position to turn out ample supplies of traction batteries. A great

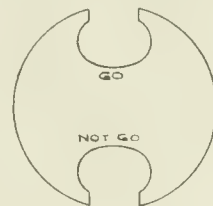


FIG. 9

increase in output will be required to meet the demand of the home market, but the arrangements now in contemplation will provide a large surplus for export to all parts of the world. The development of battery traction in Great Britain has been undertaken by an electric vehicle committee on which representatives of electric supply undertakings, motor vehicle and electrical manufacturers and various motor associations work together for progress.

MODERN PICKLING MACHINES

By P. E. R.

THE accompanying illustrations, Figs. 1 and 2, and drawing Fig. 3, show the design and construction and method of operation of the improved pickling machines developed at the Mesta Machine Works at Pittsburgh, Pa. These pickling machines are in sheet and tin-plate manufacture as well as metal pro-

chine moves the material through the acid at a predetermined velocity, ending each down stroke with a slight rebound. This action, due to the sudden admission of steam to the cylinder, tends to shake off the loosened particles and separates and shifts the material being pickled so as to allow the free circulation of acid on all surfaces. In pickling sheets this feature is of extreme importance for the reason that by no other practical method

tions of pickling and washing, while loading and unloading are taking place, together with the method of changing from acid to washing vat, a more thoroughly and uniformly pickled product is obtained at a lower cost than by any other method. As has been shown in a large number of cases, by the use of this pickling machine, the saving effected in acid consumption, labor cost, waste product, etc., is very great, to pay for the installation within a very short time.

The machine is simple in construction, has few working parts, and does not require skilled operators. A central plunger, operated by steam, carries a number of horizontal arms, from which are suspended acid-proof crates. These crates are varied in size and design to suit the amount, size and character of the material to be pickled, while the number of arms is governed by the number of baths required. During the pickling process the machine is entirely automatic in its action and requires attention only while the crates are being transferred from one vat to another. This is accomplished by depressing a single lever which admits steam to the cylinder and raises the crates from the vats. No crane service is necessary, and the only labor required is that needed to load and unload the crates.

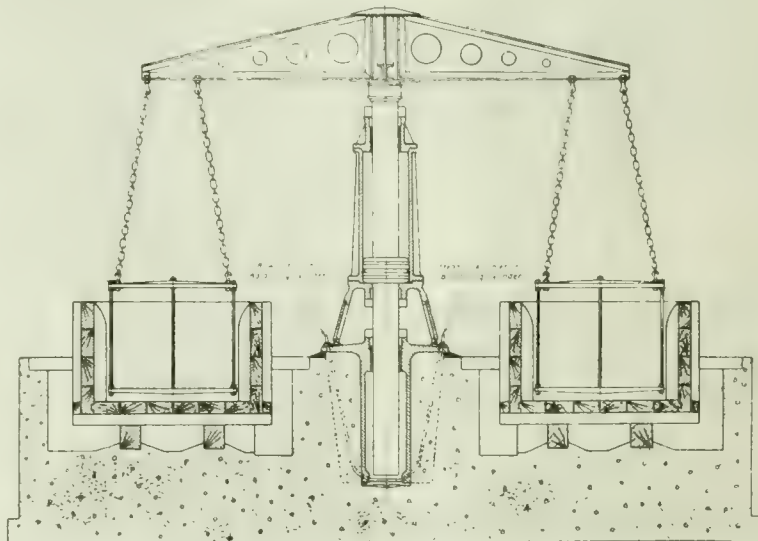
It may be mentioned that the machine takes steam on part of the up stroke only, the remainder of the stroke being accomplished under the combined influence of expansion and inertia, while the down stroke is effected entirely by gravity. The exhaust from the machine, after it has passed through an oil separator, can be used for heating the acid. In places where greatest fuel economy is desired, steam consumption can be reduced by filling the interior of the piston rod and a cylinder located in the bottom

ducts, and are successfully pickling castings, wire coils, strip steel and pipe stampings, small forgings, cartridge cases, gun parts, and various other products of iron, steel, brass and copper.

Pickling means the removal of scale and other substances from the surface of metals by the chemical action of acid. If the material to be cleaned is simply soaked in the acid an excessive amount of metal may be dissolved, with a consequent waste of acid. The cleaning is both uncertain and uneven because the acid forms in layers of varying densities, and the scale is of varying thickness. Uniform action of the acid on all surfaces is best obtained by thorough agitation and by shifting the material during the pickling, thus exposing all surfaces to the action of the acid and preventing spotting. Furthermore, if the acid washes over the surface of the metal, it has, in conjunction with the loosened particles, a scouring action which not only gives thorough cleaning, but reduces acid consumption. The acid-soaked material should be exposed to the air as short a time as possible in order to avoid the detrimental effects due to air exposure. It has been found that the above results can be properly accomplished only with the aid of machinery.

This machine brings mechanical action into play to such an extent that the material is pickled with much less labor and acid consumption than required by any other method. In operation the ma-

can the sheets be properly separated. It has been demonstrated that sheet and tin plate plants are able to materially reduce their inspection departments after the installation of pickling machines,



owing to the great reduction in the number of defective sheets produced.

It is claimed that by this method of agitating the acid and material, and by simultaneously performing the opera-

of the base with compressed air. Most of the dead weight of the moving parts can thus be balanced, so that a smaller quantity of steam is required for lifting the load in the crates. The machine per-

mits the use of two pickling baths without an increase in labor above that required with one bath. The two-bath system is very economical in acid consumption because the acid from the strong bath, adhering to the material, provides for the strength of the weak bath. Except when employed with this pickling machine, the two-bath system meets with the objection that it increases labor cost.

It is held that much of the disagree-

past to recognize the faithful service of their big business family in this substantial way.

During the past two years especially the members of this organization, in common with many others, have been working under an exceptional strain owing to the depletion of their ranks through enlistment and the high pressure of war production.

In appreciation of this fact, the H. W. Johns-Manville Company has at the end

rible destroyers of merchant ships, and in a short time these pirates, which had sent to the bottom nearly 300,000 tons of shipping, disappeared from the seas. Some had been sunk and others interned, and now the distant ocean became free again, thanks to the British naval forces."

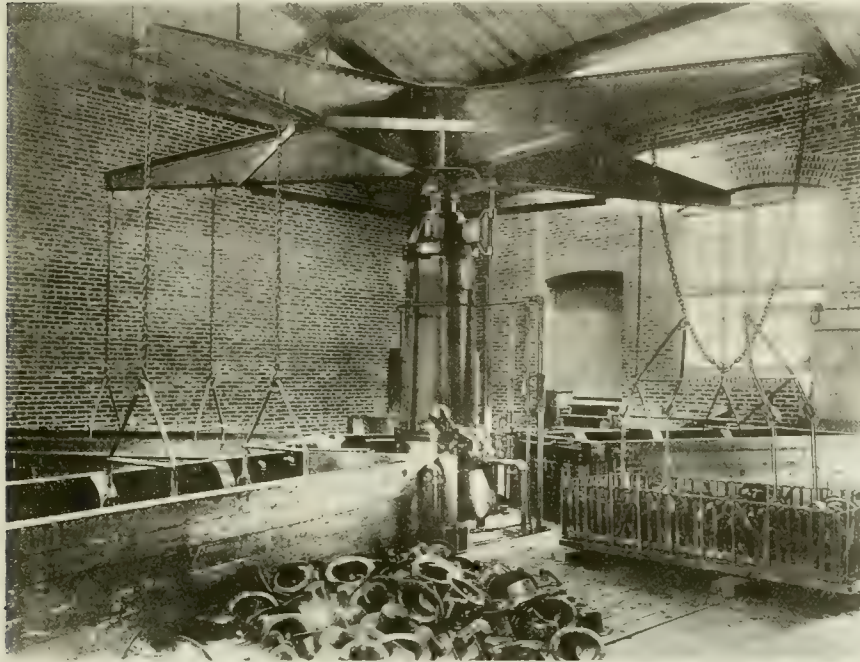
After recalling the naval engagements in which the British fleet so clearly demonstrated its superiority that the Germans realized that they could no longer run the risk of emerging from harbor as long as the British high seas fleet was on the watch for them, the "Temps" adds:

"The struggle which the British navy had to wage against the German submarines was a terrible one, but it terminated victoriously," and continues: "All the Allies have contributed to this victory, but the part played by the British navy should be specially noted. The British merchant ships have transhipped two-thirds of the American troops to Europe, and British battleships have guarded these transport ships. At the same time Great Britain placed an immense minefield between Scotland and Norway to close the submarine route to the north of the British Isles. It also made a direct attack upon the submarine bases at Zeebrugge and Ostend, and was successful in closing them. The British navy has prepared and facilitated the final victory. The applause which King George V. will receive tomorrow will testify to our gratitude to the British fleet for all the services it has rendered."

FREQUENCY OF CLEANING

The frequency with which boilers must be opened up and cleaned internally varies greatly, and depends upon the conditions that prevail in the plant. Hence no very definite recommendations can be made on this point, which could be followed generally. It is often necessary to open the boilers and clean them every week, when the water is bad and the boilers are pushed to the limit of their economical capacity; whereas in other cases it may be sufficient to clean them once a month, or even as infrequently as once in two or three months, if the water is particularly good. The man in charge of the boilers will be able to judge on these points if he is skilled at his work, and the boiler inspector will also be able to give useful advice, because he is familiar with the conditions that prevail at the plant, and he also knows what experience has shown to be good practice in other plants using similar water. Cleaning should be done oftener in dry seasons than in wet ones, because when there is but little rainfall the feed water is likely to be more nearly saturated with solid matter, and a given quantity of water will therefore deposit more scale and sediment at such times.

Cleaning should also be more frequent than usual immediately after a dry season, and likewise when there have been copious rains, or the winter snows have melted and swollen the streams and springs.



ableness of pickling is eliminated by the use of this pickling machine. The operators are not required to work over or near the acid which, consequently, can be kept at a high temperature. As the baths are located compactly around the machine, hoods may be used for the removal of fumes and the machines located in the most convenient position in respect to the flow of material through the plant.

EMPLOYEES RECEIVE EXTRA COMPENSATION

The H. W. Johns-Manville Company Distributes 20 Per Cent. Bonus on Salaries

Many progressive business organizations have adopted one or another form of profit-sharing plan for employees. Few, however, have shown so great liberality in this respect as the H. W. Johns-Manville Company, miners and manufacturers of asbestos and allied products, who will distribute to all salaried employees—men and women—from heads of branches and departments to office boys, who have been in continuous service for the full calendar year, nineteen eighteen, an extra compensation of 20 per cent. on the salaries paid them during 1918.

It has been the custom of the H. W. Johns-Manville Company for some years

of each war-year, 1917 and 1918, set the mark even higher than before—a full 20 per cent. of the year's salary.

This extra compensation for 1918 will cost the company approximately \$1,000,000.

THE ALLIES' DEBT TO THE BRITISH NAVY

In an article entitled, "A Tribute to the British Navy," the "Temps" writes: "Paris will hold a fete day to-morrow in honor of the Sovereign of Great Britain, George V, and, in his person, the British nation, whose services to the Allied cause have been one of the principal factors of victory in the war which has just been concluded. By the very force of circumstances a very clear distinction of work was established between the different countries which were fighting the Central Empires. All took their part in the general action, but France was chiefly responsible on the land fronts, while Great Britain, the mistress of the seas, had to preserve and strengthen her claim to this title while her fleet guaranteed the freedom of the ocean for the Allies, and, at the same time, kept up the blockade against Germany."

"Great Britain has splendidly fulfilled her task. From the beginning of hostilities she had to nurse the seas of all the small German cruisers, those ter-



WELDING AND CUTTING



The Development of Oxy-Acetylene Welding

Some Interesting Facts Presented Before the Institution of Mechanical Engineers by the Author—Historical Development and Data Regarding Present-Day Applications

By HENRY CAVE, Hartford, Conn.

THOUGH the United States has the honor of having started the commercial use of acetylene through the discovery of Thos. Willson at Spey, South Carolina, of the method of making calcium carbide with the electric furnace and the possibilities of generating acetylene therefrom, and has made rapid strides in its use for lighting purposes, it was backward at the inception of the use of acetylene in conjunction with oxygen for welding and cutting. In Europe, the use of hydrogen in this latter respect was a forerunner of the use of acetylene, but its use for these purposes did not reach America until even later than acetylene, except for the fusion of rare metals.

The earliest record of the oxy-acetylene torch in America was the receipt of one in 1903 by Eugene Bournonville, a Belgian engineer, residing in the United States, from his friend Edmond Fouche. This torch was used to a slight extent, operating with medicinal oxygen as no other supply was available at that time. The first commercial development was probably the formation in 1905 of the Industrial Oxygen Company to exploit the Joubert equipment of the Societe L'Oxilite Company. Andre Beltzer, a French chemist, went to the States to introduce the process, and a demonstration plant was established at the Fore River Shipbuilding Company, Quincy, Mass. The torch sold by this company was of the injector type, having changeable outer and inner tips so as to vary the flame. A submerging tray type of acetylene generator was used, and oxygen was produced by the so-called "Epurite" process, which employed, using warm water, the combination of a calcium compound with copper sulphate and sulphate of iron. The extensive introduction of this equipment was prevented by the high price charged, which was about \$2,000.00 for equipment.

An Englishman, Cecil Lightfoot, in the meanwhile established at Buffalo, New York, a plant for the production of oxygen from liquid air by the "Linde"

process, and, at the same time, purchased the Fouche patents and introduced that torch into the States. Use was made of low-pressure lighting generators as a source of supply of acetylene, as such generators had been produced in the States for years, and had been developed to a high state of efficiency.

Augustine Davis, who had been, from the inception, a fertile inventor in the field of acetylene lighting equipment, as well as an extensive manufacturer of this apparatus, visited Europe in 1906, as a delegate to the Acetylene Congress from the International Acetylene Association of America. Learning of a new use to which acetylene was being put, he investigated the matter and became interested. He learned that Eugene Bournonville was in Paris, similarly interested, and, upon meeting him, he arranged for a conference in New York, resulting in the formation of a company to exploit the Oxy-Acetylene process.

Davis and Bournonville visited Europe again and made a careful study of the status of the industry and of the various equipments in use, and made arrangements with Rodriques et Cie., to exploit the patents of their medium-pressure (French rating) torch in the United States, having determined that this torch was the most promising of the various developments that had taken place abroad. When Mr. Davis returned from France he brought an expert French workman with him, one skilled in the art of welding and cutting. The cutting equipment at that time merely consisted of a piece of tube with a screw needle-valve clamped to the side of the welding torch. This required a separate hose, regulator and tank of oxygen, and was very inefficient as compared with the wonderful results that are being obtained at this time.

In Europe the use of dissolved acetylene had advanced further than in the United States, probably due to the higher development of the automobile industry there at that time, and the fact that the shorter distances made the gen-

eral distribution of tanks a much easier problem than in that vast country. Mr. Davis, learning that he would be handicapped in the development of the process by being dependent upon dissolved acetylene, proceeded to design a pressure generator, which would provide gas compressed as required by the medium-pressure type of torch, but not exceeding 15 lb. per square inch. This pressure had been found to be safe—acetylene never having been known to dissociate at pressures less than about 25 lb. under any conditions. The development of the industry in the States was greatly assisted by the purity of the carbide produced by a large concern at Niagara Falls, making it unnecessary to use any purifying means, either from the point of view of safety or the effect the purity might have on the welds.

Oxygen was, at that time, a considerable cause for anxiety to most of those engaged in the infant industry, as the only really reliable source of supply was that of a company selling a competitive equipment and, therefore, not likely to give the best service to other than users of their own equipment, which service was very precarious, owing to the scarcity of cylinders in which the oxygen had to be shipped long distances from the one charging plant in this country. The price of oxygen was high, making the process prohibitive for a large amount of work which otherwise could have been very successfully carried out.

About this time Bournonville developed a satisfactory small plant, enabling individual users to produce oxygen from chlorate of potash, and supplied a compressor with the equipment to store the gas, first at 250 lb. per square inch, and later at 300 lb. Manganese dioxide was used as a catalyser so as to generate the gas at a low temperature. Other equipment manufacturers developed similar plants in which the heat was produced by internal combustion, carbon being mixed with the potash. These developments relieved the situation to a considerable extent. Oxygen-supply compan-

ies now started up spasmodically, but were short lived. This was mainly due to the shortage of cylinders and their high cost, as, not being produced in the country, cylinders had to be imported from Europe.

Financial interests connected with a large calcium carbide company took over the Buffalo oxygen plant, separating the apparatus business from the sale of oxygen and adopting a broad policy of supplying all users on an equitable basis. They immediately started to build additional plants in various part of the country, established warehouses, and purchased cylinders in large numbers. This gave a tremendous impetus to the development of the industry, both advantageously and otherwise, for not only did it help the concerns that were striving to develop the business on a sound basis, but it brought into the field a large amount of cheap apparatus that was sold to users without any instruction. A great deal of this apparatus came into the possession of irresponsible parties, who charged exorbitant prices for extremely unsatisfactory work. This gave the process a bad name and retarded its development to such an extent that even to-day its effects are felt in the States.

The dissolved acetylene business was also laboring under a handicap. The owners of the patents had developed a business in connection with railroads and other commercial interests, and had licensed another concern to supply gas for the automobile industry in tanks of limited size. These tanks were not suited to welding purposes, and prices were prohibitive. The parent company refused to supply dissolved acetylene for welding and cutting except where the cylinders were purchased outright; and, as the charge for a cylinder of 225 cubic feet capacity was at that time \$150.00, very few of them were sold. Such short-sightedness eventually had its own reward by producing competition even in the face of the patents, the competitors being more generous in supplying the gas without the owning of the cylinders, thus adding an additional impetus to the development of the industry and also unfortunately to the scattering broadcast of cheap welding outfits.

As has been noted, up to 1909 the use of hydrogen had not developed in the States except for a few special uses, as the expensive method of generating the hydrogen by the zinc and acid method was used. In this year, however, the American Oxy-Hydric Company installed electrolytic cells in Milwaukee, Wisconsin, and started to introduce the Oxy-Hydric process, taking over the Jottrand patents of the Belgian Company, of a somewhat similar name, which had made remarkable development. This company was not a financial success, however, for a number of causes, the chief of which was probably the fact that cutting of steel had not been developed to any extent in the States at that time, and, as is well known, welding by means of hydrogen does not compare favorably with the use of acety-

lene, except on extremely thin metal, for which there was very little scope in this country. The high price of labor made prohibitive all hand work in connection with the manufacture of the numerous small articles which were being welded abroad by this process. The company was then taken over by the same interests that absorbed the other oxygen company. More recently, however, other large companies have come into the field and established oxygen plants of both the electrolytic and liquid air process in different parts of the country.

During the last five years the electrolytic process of manufacturing oxygen has been given a great deal of attention, with the result that several concerns have manufactured and sold a considerable number of plants, which have proved very reliable when operated properly, both as to the purity of the gas produced and the safety of the process. These equipments have been very largely used for production of hydrogen for the hydrogenation, or hardening, of oils, as there is a considerable scope for the process among the big packers of the States. Of course, oxygen in large

en by hand-operated mechanisms. The illustrations show several types of these machines. Fig. 1, Plate 1, represents what is probably the most remarkable development of metal-working of the century, the "Oxygraph." This is a cutting machine made on the pantograph principle, being arranged so that the cutting torch can be guided accurately and travel at a uniform speed, so as to cut a shape out of steel, as represented on a drawing, which is carefully followed by means of a tractor-wheel, steered along the lines of the drawing, as a bicycle around a track; the tractor-wheel is driven by a small electric motor, controlled by a governor, which gives an absolutely uniform traverse of the torch, and at the same time variable speeds at the will of the operator. It is a comparatively easy matter, on the majority of shapes that would be required to be cut, to steer the tractor-wheel around the lines with an accuracy of 1-32 of an inch, and as, in one type of this machine, the cutting is carried out with a reduction of two to one from the traverse wheel, any error is reduced by half. It can be seen, therefore, that very accurate work can be

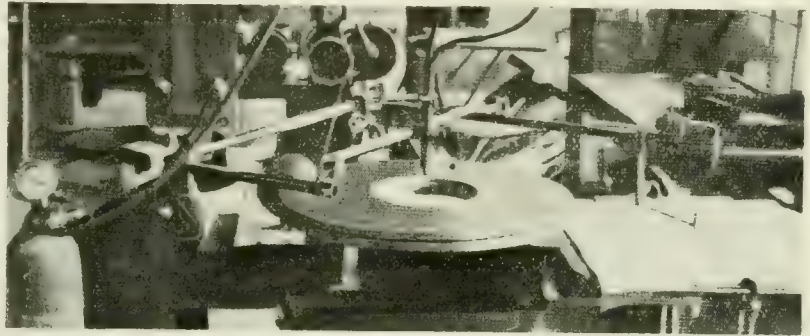


FIG. 1 THE OXYGRAPH

quantities is produced as a by-product.

For several years the processes of both welding and cutting were carried out entirely by hand. The American Oxy-Hydric Company, however, introduced some machine-cutting devices, such as were used by their parent company in France and Germany. These equipments, however, were mainly hand-driven, and, therefore were not a great improvement over the free-hand method, neither did they meet with a ready sale.

About 1909 Thomas A. Edison introduced from abroad some special machines to weld automatically the seams of the containers used in his storage batteries, these probably being the first machines to be used in this country for actual commercial work. The development of machines of this nature seems to have been neglected entirely in the United States except by the Davis-Bournonville Company and a few concerns who have made devices for special purposes for their own use.

The Davis-Bournonville Company has expended large sums of money in developing machines of a variety of types for both welding and cutting; in a general way using an electric motor for their operation, but in a few cases being driv-

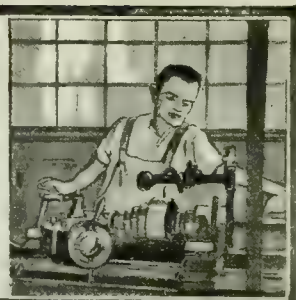
produced. Designs can be cut with this accuracy and with any irregularity of shape at the rate of from 6 to 10 inches per minute in steel up to 2 inches in thickness, and at a lesser rate for thicker metal. The smoothness of the cut compares very favorably with the regular machine-shop roughing machine tools. It will be seen that a tremendous saving can be made in cutting dies and many other regular or irregular pieces, which by the ordinary machine-shop method prove extremely tedious to produce, and take up the time of skilled workmen who could be far better applied on other work.

(To be continued)

Gurney Foundry Dinner.—The annual dinner of the employees of the Gurney Foundry Company, Toronto, was held in the lunch room of the plant on West King Street. The chair was occupied by William Gibson, general manager. Speeches were delivered by G. Gurney and E. H. Gurney. They reviewed the year's business and the latter also spoke on co-operation. The entertainer of the evening was Jules Brazil. Seventy-five covers were laid.



WHAT OUR READERS THINK AND DO



Views and Opinions Regarding Industrial Developments, Factory Administration and Allied Topics Relating to Engineering Activity

STAMP HOLDERS MADE IN A SHOP

By Tyke

To use an Irishism, there are always more ways than one of killing a pig besides hanging him, and the same applies to the mechanical field, more probably, than to any other line of industry. Whilst one way of doing a certain job may look like the acme of perfection in one shop, the same job

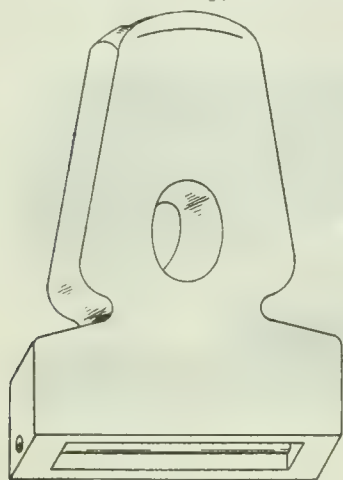


FIG. 1

may, and probably will be handled in quite a different manner in another shop, and with as good as, if not better results. Occasionally one sees "the other" shop doing the same job in a "left-handed" manner as it were, and for this very reason, it is always a profitable half hour that is spent in perusing a good mechanical publication, as the exchange of ideas often leads to a different method of procedure, and helps to reduce costs, increase production or the quality, at no greater cost. Hence this article.

Some months ago an order came along for a dozen steel stamp holders, as shown by Fig. 1. Like most other things mechanical that were ordered six or eight months ago, they were wanted P. D. Q. Of course they had to be as good a job as was consistent with requirements, and the cost had to be within reason. Upon referring to the sketches, it will be seen that but two points had to be really accurate, namely, the pocket for the stamps and the hole for the stamp retaining pin. The pocket had to have a perfectly flat seat for the stamps, and the corners had to

be square. The hole for the retaining pin was 5-16 in. diameter, and was a full hole for a distance of $\frac{3}{4}$ in. at each end, but only half a hole between the ends, and this at first sight looked as if it would cause trouble. It was, however, easily and satisfactorily overcome as will be explained in due course.

The overall dimensions of the holder were 6 in. x 5 in. x $2\frac{1}{4}$ in., and a good piece of forged steel measuring 5 in. x $2\frac{1}{4}$ in. and some eight or ten feet long was located, and from this bar twelve pieces were sawn, each a little over 6 ins. long. A template was then made to conform to the shape of the holder, and the pieces were heated and cut as shown at A, Fig. 2. After roughing them out in this manner, they were re-heated, and the hole for the handle punched out, as seen at B, Fig. 2. They were then shaped to size, and the slot S, Fig. 3, was milled $\frac{3}{4}$ in. wide and 1 in. deep, the full length of the piece, the ends chamfered as shown, and a piece of cold rolled steel of the proper dimensions was welded in at each end, leaving the stamp pocket with perfectly square corners and a flat seating for the stamps. The length of this pocket was accurately maintained by inserting a piece of cold rolled steel of the proper length during the time the ends were being welded in.

After welding, the ends were dressed and marked off for the hole to be drilled. This was accomplished by inserting a piece of cold rolled steel and clamping it in position until the hole had been drilled. It will be seen that the solid

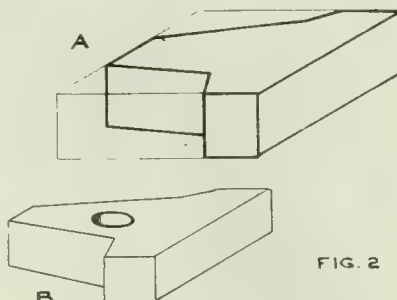


FIG. 2

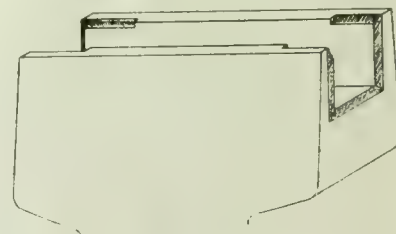


FIG. 3

ends acted as a drilling jig, and the loose piece in the pocket prevented the drill from finding the path of least resistance and spoiling the job. After drilling one holder, this loose piece was taken out and used on three more oc-

casions, or until the four sides had been cut away; thus three pieces were required in order to drill the twelve holders. After drilling they were all touched up a little and given a coat of black paint, which lent an air of finish that is all too seldom seen upon the products of the small shop.

A NEW DRAFTING INSTRUMENT

I heard a new drawing office story the other day so thought I would send it along to CANADIAN MACHINERY.

Jones is an old architectural draftsman, but owing to the scarcity of work in the building trade he recently migrated into a mechanical drawing office.

The other night he met Smith, who is a mechanical draftsman of many years' experience and the subject naturally drifted into drafting and from that to the equipment used there. Jones was somewhat verbose in his remarks, speaking of the style of tables used, method of keeping records, etc.

He also said that most of the calculations were obtained with the "guessing stick."

It might be well to stop here long enough to describe this instrument.

Subject, Guessing Stick; scientific name—slide rule, an instrument made use of by college graduates and would be's to obtain computations.

An example to show its value is as follows:

Take $3 \times 3 = 9$. To obtain this answer with the guessing stick, we move the sliding member in the correct direction

(book with full directions given with each instrument) to the proper location and obtain the figures 8.999876. Note the figures underlined are those obtained by guessing, hence its name. We next take a factor for expansion

and contraction caused by weather conditions and add it to the above result and obtain the answer 9, which is the correct solution of the problem.

But to return to the story: Jones said one of the boys had an instrument, which was both useful and valuable for obtaining angles, called a Protractor, made in France by a firm Bernier.

Smith tried to remember all the protractors made but could not recall one by that name, so asked Jones to bring it down to look it over.

The next night Jones had it for inspection and when it was taken out of the case it proved to be a standard Brown & Sharpe steel protractor with the Vernier scale.

The name Vernier was foreign to Jones and he had taken it to be the name of the maker but had read it Bernier. Smith told him the instrument was not very new and they had about ten in use in their office.

I haven't seen either of them for a few days and wonder if Jones has discovered anything else original since the new drafting instrument.—Robert Mawson.

BORING AND FITTING LATHE JAWS

By M. H. Potter

Often pieces to be machined are of frail construction and must be held in a way to prevent distortion and ensure a true job after the piece has been removed from the chuck. This result is accomplished by the use of chucking rings added to the casting, the chuck jaws being bored especially to fit. The chucking problem is solved in some instances by providing in the casting three holes of proper dimension in which to insert the jaws.

In connection with the chucking problem comes the order of operations, which sometimes influences the method of chucking. Some castings, if properly chucked, may be finished at one setting, while others will require as many as three or four chuckings before the piece can be finished, especially when the size limits are very close.

The first and most important point is to hold the work securely, and to accomplish this end special jaws are often absolutely necessary.

Surfaces on which the jaws bear are usually tapered, caused by the draft on the pattern or in the forging dies, and this makes chucking difficult with the ordinary standard chuck jaws. However, by boring or turning the jaws to conform to this taper, the work may be held for very heavy cuts.

Jaws for rough castings and forgings should be corrugated and hardened, making teeth from 1-32 in. to 3-64th in. wide on top and from 1/8 in. to 3-16 in. wide at the bottom, and from 1-16 in. to 3-32 in. high. This type is almost always made of machine steel, carbonized and hardened, although tool steel may be used with equally good results if properly hardened and drawn. The teeth of the corrugated jaw sink into the work, and for this reason should not be used on finished work.

When this type of jaw is used under extra heavy work the pressure of the tool will cause the teeth to sink far enough into the work to loosen it slightly, necessitating a second tightening, although the jaws may have been as tight as possible at the start.

The main object in boring and turning jaws is to have them conform to shape of the surface on which they are to bear. The method which has proved most practical and produced the best results is as follows: An object of some kind should be gripped in the jaws as near as possible to the point where the jaws will take their bearings on the piece to be machined. As a standard equipment for this work a set of three studs and a steel ring are used. The studs are placed in the counterbored holes, one in each jaw, and the ring chucked in them. This sets the jaws in the proper position for boring. They should be tightened up on the ring with about the same pressure as will be used when chucking the work.

A greater accuracy is necessary when preparing jaws for chucking on finished work, especially when it is desirable to have the chucked surface run true. The jaws should not be bored the exact diameter of the piece to be chucked but an allowance made for spring. This allowance will approximate .0015 in. to each inch in diameter on the chucking circle for finished surfaces and the allowance should be doubled for rough castings. For example, if a piece to be chucked is 4 ins. diameter, the jaws should be left about .006 in. small when boring and .006 in. large when turning. If the jaws are being prepared for a rough casting, the allowance should be about .012 in. or 1-64 in.

When the jaws are bored or turned on a large circle the measuring must be done from the tool to the jaw.

The allowances given are approximate and cannot be depended upon absolutely. Good results are obtainable by marking the chuck pinion used to tighten the jaws when in the tightened position. When the jaws are tightened on the work the pinion should be in exactly the same position as when boring. If not, the jaws should be rebored or turned as the case may be and more or less stock left to take up the spring as required.

For chucking on finished surfaces, or second operation work, the same pinion should always be used to tighten the jaws on the work as when used to tighten them on the ring when they were bored out or turned. This will bring the scroll to the same position on the rack of the jaw base and the work will run true within .001 in. providing this method is carefully followed and the chucked surface is round and uniform in size. It may be necessary occasionally to rebore the jaws if large numbers of pieces are being machined at one time.

The ring and stud plan is used for turning as well as boring, only the ring is chucked on the studs, which is just the reverse of the boring operation. If a ring cannot be found suitable for the work, heavy soft wire may be used to hold tension on the jaws.

When necessary to resort to the wire the jaws should be run in half an inch or so from the circle on which they will be turned and the wire wound around and securely fastened. Then return the jaws to proper position, being sure wire is tight and proceed to turn to proper size.

If the jaws are taper-bored or turned the taper attachment will of course be used.

ALL-STEEL FACTORY AND SHOP EQUIPMENT BECOMING THE RULE

High-grade furniture steel has proven most adaptable and versatile in the construction of factory and shop equipment such as cabinets, shelving, stock-room partitions, lockers for employees and for material, etc., and is fast being adopted by Canadian firms generally.

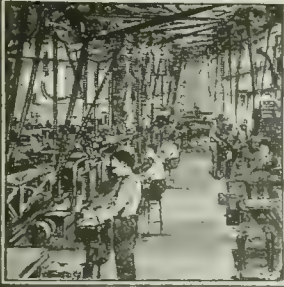
There are many reasons for the universal use of steel in such items of equipment, chief among which are its quality of being fireproof, its capacity to bear heavy weights, its indestructibility, its capacity for standardization, permitting a concern to start with a small amount of steel equipment and add other uniform pieces as requirements demand, and its low ultimate cost as compared with wood.

The Dennis Wire & Iron Works Co., Limited, of London, Ont., have pioneered in this industry in Canada, and have achieved for their well-known line of "Dennisteel" factory and shop equipment a very high reputation for quality and durability.

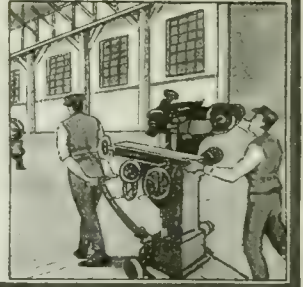
Recent figures on work just completed for The John Bertram & Sons Company, Dundas, Ont., are of timely interest. In the warehouse for small tools alone, this company had no less than one-tenth of a mile of Dennisteel shelving installed, with bin fronts, label holders, etc., besides a great many stacks fitted with drawers for small drills, taps, etc.,—aggregating a total of some 1,200 drawers, each with label holder to indicate contents. These stacks are built to carry extremely heavy weight on account of the nature of the material stored. The standard Dennisteel type shelving and drawers was used in anticipation of the necessity of adding similar units from time to time.

All this equipment was planned and installed so that the stacks, instead of being placed along walls, run out from the walls to the centre of the warehouse, leaving passageways between, and the layout is such that between each row of stacks there is a window, providing sufficient light and air. All stacks extend the same length, and the whole presents a most orderly, uniform appearance, and will make the task of stock-taking comparatively simple.

For the same firm, the Dennis people are installing some 200 steel wardrobe lockers for the use of employees, besides complete equipment of steel tables, foot-rests, stools, etc., in the drafting room, the whole making one of the most up-to-date installations of all-steel units in the Dominion of Canada to-day.



DEVELOPMENTS IN SHOP EQUIPMENT



Makers of equipment and devices for use in machine shop and metal working plants should submit descriptions and illustrations to Editorial Department for review in this section.

UPRIGHT GENERATING PLANER

THE Newton Machine Tool Works, Philadelphia, in bringing out their new upright generating planers, have vastly improved upon what were formerly known as slotting machines. One of the latest of these machines is shown in the accompanying illustrations.

These rack-driven slotting machines or upright generating planers are built in sizes having 36 to 72 in. maximum stroke, and are now built for reversing planer type motor drive only.

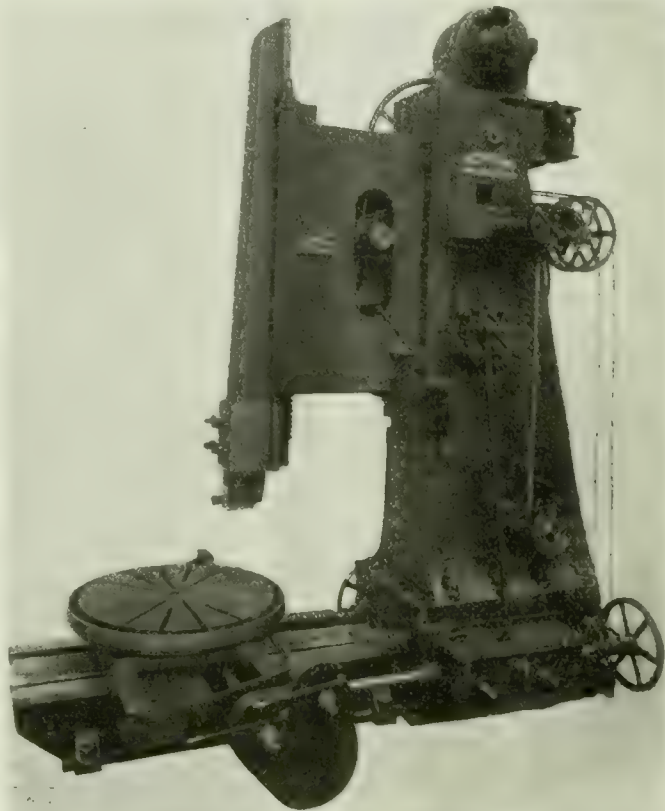
Rapid traverse for table motions can be provided as an extra, when desired, through incorporation of suitable mechanism and use of extra constant speed motor.

The ram or cutter bar is counterweighted and has square bearings in the guides with a taper side adjusting shoe and, on all sizes, the vertical clamping surface is solid and steel faced and equipped with suitable tool-holding clamps.

Beneath the ram or cutter bar is mounted a newly developed steel swiveling relief tool box apron, which can operate in any position of a complete circle.

Motion is transmitted from the motor to the broad face steel rack on back of the cutter-bar or ram through all steel spur reduction gears, whose coarseness of pitch and width of face increase with reduction of the gear speed.

All gears are covered and on the operating side of machines all gears are totally enclosed. Circular tables are heavily ribbed and of substantial construction and have a full bearing on the



UPRIGHT GENERATING PLANER

saddle, to which they are held by corner clamps. These tables are now centered by a deep face, large diameter bearing.

Oil pans are cast solid with circular tables, and are graduated on the exterior into 360 degrees.

Table saddles have narrow guide alignment control with centralized location of feed screw and taper shoe control of fit. Hand adjustment of the saddle is provided for from both ends of the cross slide.

All feed motions are independently clutched, and clutches have independent levers. Cross slide is of heavy box type section and has square bearings on the base, with side adjustment taper shoe. Adjustment is from operating side, as well as from front of machine.

Feed screws have bearings on each end to insure operation in tension. Particular attention is called to a newly developed sensitive stroke control disc the trips on which can be operated by hand while machines are in motion, which is desirable as drift of motors have to be compensated for.

The feed motion is taken from a rock-



SIZE OF CHIPS COMPARED TO A FOOT-RULE

ing friction box, on the outside of which the pawl rod stroke adjusting screw is located.

The circular, cross, and longitudinal feeds are variable in rate, and reversible through the use of pawl and ratchet wheel.

The cutter bar guide on the 26-in. stroke machine is cast solid with frame, and, therefore, does not have any vertical adjustment.

The cutter bar guides of the 56-in. to 72-in. machine inclusive are separate from frame and have vertical hand-controlled adjustment to permit their location in positions relative to cutter bars.

The cutter bar guide adjusting mechanism is of tandem design to prevent dropping of guide in event of accidental breakage of counterweight ropes.

QUICK-MAKE STARTING SWITCH

One of the new equipments brought out by the Westinghouse Electric and Manufacturing Company during the past year is an interesting starting switch. The switch is designed for use where squirrel-cage motors are started with a full line voltage. The switch is known as the Quick-Make (and quick-break) Starting Switch (Type 816). Its characteristics are 10 to 100 amperes, 25 h.p. maximum, three-phase, 220, 440, and 550 volts.

This switch is extremely flexible in its applications; in addition to being a motor starting switch it can also be used to control feeder circuits; it may be supplied in any of the following combinations, each having the "quick-make and quick-break" feature, for either hand or shipper-rod operations:

- (a) Non-automatic switch.
- (b) Switch with low-voltage protection.
- (c) Switch with inverse time element overload protection.
- (d) Full automatic switch with low-voltage and inverse time element overload protection.

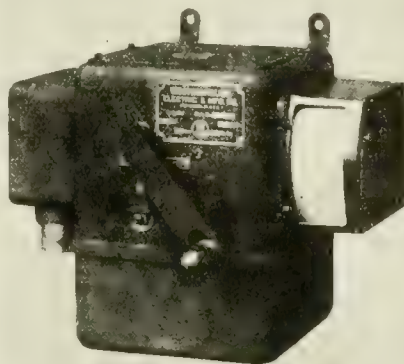
It is especially suitable for shipper-rod operation on account of the positive action of the contacts. It is impossible for the operator to retard the motion of the contacts after they have started to close—there can be no "teasing" of the contacts. Workmen who are accustomed to starting machines from line shafting by means of shifting belts have no confusing details to learn. They may start the motor-driven machine with the same starting motion they use in shifting belts.

Contacts are opened and closed in oil, thus effectually suppressing arcing. The contact is made or broken so quickly that the eye cannot follow the motion. A rolling action confines the arc to the tips of the contacts and prevents pitting or roughening of the seating parts where final contact is made. A strong spring holds the contacts firmly in the closed position. These features result in greatly prolonged life for the contacts.

Construction.—Drawn-steel construction is used, giving maximum strength

with light weight, and assuring uniformity and interchangeability when new parts are needed for replacement or repairs. The oil tank is supported by snap ring-latches. Removal of the tank clearly exposes the contacts and makes them easily accessible. When necessary to replace contacts each may be removed by taking out a single screw.

Contacts and contact supports are of the same construction used for West-



SWITCH COMPLETE

inghouse type A auto-starters and magnetic contractors. This minimizes the number of spare parts that should be carried.

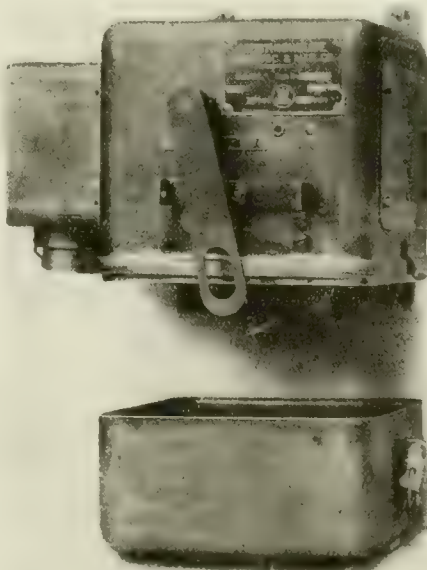
These starting switches are dust-proof.

Openings are provided for conduit wiring into the top of case; terminals for connecting motor and line wires are accessible when cover at top of starter is removed.

Micarta insulation is used throughout.

Overload and low-voltage attachments may be added with no change in switch mechanism, as the toggle trip is common to all combinations of this switch.

Low-voltage protection not only opens the contacts on failure of power, but



SWITCH WITH CASE REMOVED

makes it impossible to close them again until return of voltage. Since the low-voltage coil is connected in the line circuit continuously, means have been provided to close the armature of the low-voltage circuit when the switch is in the "off" position, thereby giving protection to the coil and preventing burn-outs. A safety stop may be provided by connecting one or more push buttons in series with the low-voltage coil.

Overload Relay.—The overload relay is the same as that used on Westinghouse type A auto starters. It has the inverse time element feature and is equipped with a regulating device, adjustment of which controls the degree and duration of the overload possible on a motor or feeder circuit. This adjustment can be made without opening the switch cover.

Hand Reset. — This is an additional safety feature which makes it necessary to set the mechanism before the switch contacts can be closed. Whether the contacts have been opened through the operation of the low-voltage coil, the overload relay, or by moving the switch handle to the "off" position, it is impossible to close them again until the switch handle has been moved to the "reset" position. Thus protection is afforded workmen and valuable machinery which might be injured by accidental starting of the motor.

A NEW BY-PRODUCT PLANT.

A new battery of 35 simplex regenerative ovens has recently been erected at the Lambton Coke Works at Fence Houses in Durham (Eng.), and these regenerative ovens were decided upon to avoid the erection of another boiler plant and many considerations had entered into the arrangement of the by-product plant. There was an indirect recovery plant for 35 over, including a rotary scrubber, and room for only two 100,000 ft. per hour exhausters in the exhaust house. It was therefore undesirable to have two separate streams of gas, as there could not be a spare exhauster for each battery. It was therefore finally decided to have one stream of gas on the pressure side, the suction from the two batteries uniting at the exhauster and being regulated by valves. The gas then went through a Pelouse tar extractor to the saturator, and after cooling, to the benzol scrubber, which consisted of the old rotary scrubber rebrushed, plus the former tower benzol scrubbers. The oven walls in this plant are parallel, which are in many obvious ways a great advantage. It has been said that there were some expanding or salt-containing coals for which parallel walls were unsuitable, but this has yet to be proved. Tapered ovens are a relic of the days when, owing to uneven heating, ovens could not be pushed, and some brilliant genius had thought that by giving a 2 in. taper in 400 in. he was doing something to outdo other coke-oven contractors.

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Know More of Each Other

THIS business of employers organizing to protect **their** interests, and employees organizing to protect **their** interests is not going to get us very far in the bringing about of conditions where industrial expansion will be possible.

It may be a homely way of stating the case, but what is urgently needed is that both employers and employees should organize to understand each other's business.

Go right down to the root of the trouble, and it will be found that suspicion and distrust lies very close to the origin of all the industrial unrest we have.

The man in the office has a sneaking idea that the man in the shop is going to slip one over every chance he gets, while the man in the shop is dead sure that the man in the office is taking advantage of him at every turn.

The more the company knows of the business of the men, and the more the men know of the business of the company, the harder it will be for labor unrest to get a chance to sprout and grow.

No Labor Troubles Here

AN industrial concern in one of Ontario's cities has had good business during the past few years. Work has been hard and long. Foremen and superintendents have been called upon to work hours they never bargained for or thought of. But they did it. The work was there—it was urgent, and they saw it through.

When the annual business meeting of the firm was held not very long ago these services were not forgotten. They were not simply referred to, as is often the case. In fact, for a business body to refer to a man's services without giving tangible recognition of the feeling, is better left undone. The plant officials were presented with cheques. They were not for fifty or one hundred, but ran up in the thousands, many of them for three thousand dollars each.

There might be room to say a very great deal in connection with the working out of this plan, but for the purpose of this little article the only point we wish to make is this:

THIS COMPANY NEVER HAS ANY LABOR TROUBLES.

John Bull Not So Slow

MANY interesting stories are told of the manner in which camouflaged ships were used to advantage during the most trying days of the war. An exchange gives the following:—

"The great Belfast shipbuilding yard of Messrs. Har-

land and Wolff initiated, quite early in the war, the transformation of certain cargo boats into make-believe warships; such accurate representations of the most powerful super-dreadnoughts afloat, that their very appearance on the horizon sent the Huns scuttling homeward, with the safety valves tied down to get the last fraction of a knot out of the ship. There were 14 of these vessels built at this one yard and they all did magnificent service. One lay off New York harbor for weeks, thereby keeping a large German steamer bottled up, as she dared not face the terrible British battleship lying off-shore. This same 'battleship' was a poor, old disguised tramp, that could have been sent to the bottom by a hit or two from a 3-inch shell!"

John Bull is often pictured as being a little bit slow and not overly quick to pick up with new ideas, but when the story is all told the chances are that it will be seen that said J. B. was very much alive and well up to the front of the procession.

Where Care is Needed

AN Order-in-Council, passed at the end of 1918, provides that engineers holding current certificates shall be eligible to act as inspectors for boilers, so long as they do not pass on boilers that may be directly under their own supervision.

There are very good reasons to doubt the wisdom of such a step.

There are engineers holding certificates who can be entrusted with inspection work, and there are engineers holding certificates who could not pass on a boiler acceptably.

The testing of boilers is a profession in itself. The man who goes about posing as a boiler inspector must **KNOW** absolutely what he is about. He must not **GUESS**. His analysis of the situation must be the last word.

To do this work it is necessary to understand boiler construction from the standpoint of the finished mechanic; it is imperative that a certain knowledge should be had of the technical details that determine the strength of material, of joints, etc. These are matters that take a great deal of study and preparation, and we would be very agreeably surprised were we to be authoritatively informed that every engineer holding a certificate was thoroughly capable of meeting these requirements.

As stated above, there are engineers who can do boiler inspection work. They are qualified beyond doubt. But there are others who are not qualified, and it is a dangerous practice to throw the doors wide open on such an important matter.

The Ton For Ton Basis

CERTAIN French interests are already out with claims as to how much tonnage should be awarded to France to make good the losses which she suffered during the German submarine campaigns. In all, the figures show that France wants to secure almost five million tons of shipping. There is no person in the Allied Countries who would think of doing anything that would hinder the complete re-establishment of the Republic, but there are other figures that should be considered before action is taken.

It would seem only fair that the actual tonnage losses suffered by the various Allies would be a fair basis for replacement figures. There should be no desire to gain advantage in the allocation of tonnage. If all were restored to the same basis of merchant tonnage as they possessed at the outbreak of the war, there should be no cause for complaint.

Lloyd's figures show that the losses of the French merchant marine were 400,000 tons, while the losses to British merchant marine were 4,000,000 tons. Now if France is out for a replacement of five million, will some person with a good head for figures please figure out what tonnage the British people are entitled to ask for.

Ton for Ton Should Be Proper Basis to Adopt

British Are Well Aware of the Necessity of Seeing That Shipping Tonnage is Restored to Pre-War Basis—What French Navy League is Making in Way of a Request

ALTHOUGH little has come to the surface, there is keen discussion going on in many circles with regard to the disposal of the vessels taken from the enemy. The idea, and it is fair, is that these boats should be used to make good the losses caused by the submarine campaign. That is, if Germany sank a thousand tons of British shipping—she should be called upon to replace it with the same amount.

The whole issue is well dealt with by a correspondent of the *London Times*, who signs himself "A Past-President of the Chamber of Shipping." He says:—

Lord Inchcape, in the public-spirited and patriotic action which he and Sir Owen Philipps have taken with regard to the transfer of standard steamers now under construction from the Government to shipowners, has arranged for the vessels to be "distributed as far as possible on an equitable basis having regard to the losses sustained by the owners through enemy action." This is so obviously the fair course to adopt that I hope it will be followed by the Allies and America when they come to deal with the allocation of the German merchant ships in giving effect to the ton for ton policy.

In order to avoid misunderstandings and to present extravagant claims being put forward, it is highly desirable that we should have an authoritative statement of the tonnage possessed by each nation before the war, and the tonnage owned at the present time, after deducting losses sustained and additions made during the war. It is only by this means that we can obtain a clear conception of the position of the shipping industry throughout the world and can view the situation as a whole and in proper perspective.

This is all the more necessary as already claims have been advanced which have no justification in fact, as would immediately be seen by reference to the actual figures. For instance, the French Navy League is reported to have appealed to President Wilson, and suggested that the following steps should be taken to enable the French Mercantile Marine to be reconstituted:—

1. The allocation of 930,000 tons of German and Austro-Hungarian ships, in order to replace, keel for keel and ton for ton, the French vessels destroyed by the enemy.

2. The assignment of German coal to the French iron industry so that French shipbuilders may be on a footing of equality with foreign shipbuilders.

3. To render it possible for French shipowners to purchase immediately 1,000,000 tons of shipbuilding built in the United Kingdom on conditions acceptable to British shipowners.

4. To render it possible for French shipowners to buy immediately 1,000,000 tons of shipping built in the United States.

5. The authorization of American shipyards for the immediate construction of 2,000,000 tons of cargo steamers for French shipowners with permission to transfer the same to the French flag.

This appeal is made to President Wilson with a view to his supporting these claims at the Peace Conference.

I have nothing to say concerning suggestion 2, but with regard to the others, I think it is desirable to state the facts so far as they are available. The most reliable figures dealing with the merchant fleets of the world are those published by "Lloyd's Register of Shipping." I have taken out the particulars contained in Lloyd's Register Book" for 1914, and made up the corresponding figures as far as possible to the end of October, 1918, and find that the steam tonnage owned by the principal Allied and neutral countries was as follows (for the purpose of

comparison the tonnage trading on the Great Lakes of the United States is excluded):—

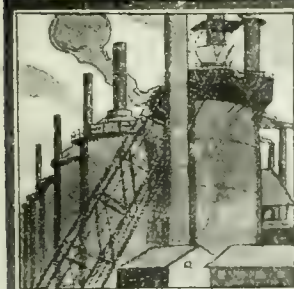
Flag	July, 1914	Oct., 1918	Gross Tonnage	
			Increase or decrease	% on 1914 figures
British—				
U. K. . . .	18,892,089	15,031,375	—3,860,714	— 20.4
Col. . . .	1,631,617	1,828,561	+ 196,944	+ 12.1
Total . .	20,523,706	16,859,936	—3,663,770	— 17.9
U.S.A. . . .	2,069,637	5,116,521	+3,046,884	+147.2
Belgian . .	341,025	189,963	— 151,062	— 44.3
Brazilian . .	307,607	508,245	+ 200,638	+ 65.2
Danish . . .	770,430	612,940	— 157,490	— 20.5
Dutch . . .	1,471,710	1,030,137	— 441,573	— 30.0
French . . .	1,922,286	1,536,730	— 385,556	— 20.0
Greek . . .	820,861	259,174	— 561,687	— 68.4
Italian . . .	1,430,475	989,575	— 440,900	— 30.8
Japanese . .	1,708,386	2,039,794	+ 331,408	+ 19.4
Norwegian . .	1,957,353	1,414,927	— 542,426	— 27.7
Spanish . . .	883,926	671,425	— 212,501	— 24.0
Swedish . .	1,015,364	810,489	— 204,875	— 20.2

Now it will be seen that while France is down 385,556 tons upon her pre-war total, the United Kingdom is down 3,860,714 tons. These figures speak for themselves and render it unnecessary for me to labor the point that, in dividing up the ships of the German Mercantile Marine and in arranging for the production and allocation of new tonnage among her Allies, this country is entitled to the lion's share. Everyone, I am sure, would wish to deal with our gallant French Allies in the most sympathetic and generous manner both as regards shipping and everything else. But we must be just to ourselves, and I am voicing the opinion of many of the members of the shipping community when I say that we fear this necessity is too apt to be lost sight of in some of our international arrangements.

We have already agreed to build some 500,000 tons of ships for France, to build (over a period of three years) some 750,000 tons for Norway, and to supply Italy with steel to enable her to carry out her shipbuilding programme. All this at a time when our own Mercantile Marine is just emerging in sadly diminished numbers and efficiency from the most colossal losses which it has ever experienced, and making heavy demands upon the whole of our shipbuilding resources with a view to its immediate reconstruction.

What is done cannot, of course, be undone, and whatever we have agreed to carry out for our Allies and for neutrals we must honorably fulfil, although upon the figures quoted I fail to see the justification for the agreements already made, but I feel compelled to enter an emphatic protest against any extension of these arrangements in response to extravagant appeals from any quarter whatsoever.

Happily we have in Sir Joseph Maclay, the Shipping Controller, and Sir Thomas Royden, who will represent him at the Peace Conference, men of the highest ability and widest practical experience in shipping matters, and we should all be quite content to leave the question in their hands, confident in the equity of any arrangements to which they may agree. But in case they be overruled in a matter which is of such vital importance to us as a nation—more vital to us than to any other nation in the world—it behoves us to make sure that our heritage of the sea shall not be frittered away by concessions which are not justified by the facts. Let all claims be dealt with by the touchstone of the actual figures, and no one, whether ally or neutral, can reasonably ask for more.



MARKET DEVELOPMENTS



Business Improvements Are in Evidence

One Firm Reports More Machine Tools Being Sold Than in the Same Period Last Year—A Sharp Advance May Take Place in Some Lines of High-Speed Steel

ALTHOUGH it would be too much to state that there has been enough buying of machine tools and supplies to call it a revival of the industry, still there is good business moving now. One dealer stated this week that so far this year they had done more business than during the same time last year, while a supply man stated positively that he had done more business in the last two weeks than in the six prior to that time. Warehouses report a large volume of business moving, along the lines that were in evidence before the war started. So it is evident that the touch of war is being removed from trade in Canada. The process may be rather slow, but it is none the less certain.

Many of the shops in the industrial centres of Canada are in good shape. They have, in reality, turned to their pre-war activities, and find business good. In others the lessons of war work are being applied to present problems. For instance, one shop that did jobbing work before the war, started on the making of marine boilers, securing considerable business from United States Government. They were careful in their operations, and kept strict record of costs, etc. Now they are out after this sort of business again, and are positive that they can compete with any of the yards in the business.

Prices of plates have been brought to a 5.50c per pound base. This is approaching the best that the warehouses can do. They are now in a position to get the 3c price at U.S. points, and as this material is put in with the war-price material it brings down the average. There is a feeling that this price will have to come down a shade yet before it reaches a stage where much trading will be done apart from material for actual consumption. There has been a slight recession in the price of sheets as well. Tubes, also, are on a new list, showing reductions of from ten to twelve per cent. Shipments of these are coming across in good style, and warehouses are well stocked.

The Canadian National Railways are in the market again for more supplies, and dealers are tendering on a good sized list.

Some uneasiness is felt owing to a rather stiff increase in price of high speed goods, which is threatened in catalogue supplements which have been sent out. It amounts to about 30 per cent. on some lines of goods, and some of the dealers are at a loss to explain the matter, as it had been thought high speed steel had gone the limit during the days of the war.

MONTREAL MARKET STILL WAITS FOR MORE PRICE CONCESSIONS

Special to CANADIAN MACHINERY

MONTREAL, February 27. — The general industrial situation is still reflecting the waiting attitude that has been more or less pronounced since the beginning of the year. Many encouraging reports are given as to enquiry for material for domestic enterprise, but actual buying is still confined to immediate requirements, with peace-time interests playing a guarded game, apparently awaiting more settled conditions before embarking on extension programmes. There is evidently a growing enquiry for material, particularly on those lines that have experienced steady declines for the past two months. Steel interests are evidently preparing for greater activity, and the supposition is that this will develop before the early summer. The metal situation is quietly attaining a normal state, but various conditions combine to prevent a hasty return to pre-war status. It is anticipated, however, that a sound basis will

shortly be established whereby the confidence of the trade will open the way for a renewal of ordinary business. Trading in machine tools is in a state of transient stagnation, with slight ripples of activity to relieve an otherwise uninteresting situation. Scrap is scrap, and the large volume available at the present time, together with the light demand, eliminates the possibility of dealers' activity for some time to come.

Steel Inquiry Improving

While little can be said of the immediate developments in the steel trade it is encouraging to note that the consumers' interest is far from being stagnant, and the inquiries coming into dealers are of a character to infuse hope before the summer is well advanced. The starved condition of domestic expansion during the past four years is being felt in many quarters, but with the clouds of uncertainty still hovering

over the country's activities, few are willing to take the plunge into the rising wave of post-war enterprise. Dealers' reports, however, indicate that prospective buyers are watching developments closely, and as soon as the atmosphere clears heavy trading in steel is anticipated. The fact that restrictions have prevented peace-time expansion for so long a period, is one of the factors influencing the buyer in his policy of waiting a little longer in the hope that conditions will become stabilized and thus instill confidence into trade circles generally.

Keener Competition in Tools

Machine tool dealers have experienced another week of comparative inactivity. Some few sales have been made, but the volume is small when compared to that of a few months back. A feature of present trading is the keen interest displayed by dealers when a list of tools are desired. The competitive character of the trading more than emphasizes the anxiety of tool manufacturers and dealers, to get a slice of what business is now passing. Quite a number of sales of munitions machinery, that is more or

less of a general nature, have been reported, but shell equipment on the whole is not in great demand. Prices at present are an influencing factor and the reasonable offers of lightly used standard tools are being accepted quite freely. The general supply trade is steady, but the volume of the requirements is relatively light, shipyards and railroads being the principal buyers.

Scrap Still Weakening

The decline that has recently taken place in scrap metal quotations has not made much impression on the general situation. Dealers are not overtaxed with demand for material, and consumers apparently are not influenced by what might be considered fair prices under existing conditions. Some business has been done by dealers in the purchase of shell shop equipment, but the disposal of this is a more difficult matter. Small sales are still the order, but buying for future requirements is not in evidence. Local trading is light with prices nominal. Declines are noted on a few steel scraps; boiler plate at \$14 shows a drop of \$2 per ton. Machine cast iron is quoted at \$18, also a decline of \$2 per ton. A reduction of \$1 is noted on wrought iron pipe, the price quoted being \$9 per ton.

REPORT BUSINESS AS MUCH BETTER

More Machine Tools and Supplies Selling Than Has Been The Case For Some Weeks

TORONTO. — The downward trend of prices continues. This week plate and tubes are the articles most concerned. Plate comes down to 5.50 and is gradually working about as close to a competitive price with United States direct shipments as can be done.

Machine tool trade continues to improve. One of the largest firms doing business in Toronto reported this week that they had done more business so far this year than they had for the same time last year, while another dealer in supplies reported more sales of goods for the last two weeks than in the six preceding them.

Prices of machine tools hold firm. In fact the figures that are being placed on some of the high speed lines of supplies are greater now than they were during the time of the war.

The Machine Tool Market

While it is undoubtedly true that dealers are chasing a large number of prospects that never will amount to anything in real sales, yet there is a good amount of actual business being done, both in metal and woodworking machinery. In the latter class there should be selling shortly that would be worth while. There are a large number of places in Ontario where the housing situation has become so acute that action will have to be taken. Prices of material still hold high, as well as the wages of men who would have to be called in to construct the houses. Allowing for this, the necessity for building is reach-

POINTS IN WEEK'S MARKETING NOTES

Arrangements are being made to get rid of the surplus stock of war machine tools in United States by selling them to state institutions and foreign countries.

United States reports small sales of machine tools for export because England and France are in such good shape to attend to much of the business.

The New York machinery market is dull. There are many inquiries, but few sales are being made.

While most prices hold firm for machinery, an Ohio builder of punches, shears, radial drills and other plate-working machines, has cut prices about 20 per cent.

Machine tool dealers in Toronto report a decided improvement in business. One firm states that their business this year is much in advance of that for the same period last year.

Canadian dealers are receiving notice of a sharp advance that is being made in the price of high speed cutters, saws, etc.

Plate prices, both in Montreal and Toronto, were pulled down again. The present steel price from warehouses for plate is 5.50.

A new list is out on boiler tubes, and prices for both seamless and lapwelded are down on an average of between ten and twelve per cent.

Pittsburgh mills report that very little business is coming in, and that further curtailment in output is necessary.

When steel mills drop as low in production as 40 per cent of capacity the ton costs become intolerable. In fact at from 60 to 70 per cent of capacity the costs become abnormal.

ing such a stage in several places, that it will take more than abnormal costs to hold it up much longer.

"We have done more business this year than we did in the same time a year ago," is the way one of the largest firms in the country sized up conditions for their Toronto office this week. "The trade that was moving a year ago was all war work, while the sales that are being put through now are very much of the same kind as we handled before the war broke out. It is in reality a return to the pre-war lines that we have heard so much about. I would not say that the business we are handling is

confined to any particular lines. It is general. Of course the amount of used machinery that is coming on the market now interferes to some extent with the volume of trade in new equipment that might otherwise be passing, but we are hopeful that the greatest part of this war material will soon be absorbed or scrapped. We had anticipated the effect of this machinery on the market, and it is not working out any worse than we had anticipated."

Speaking of Prices

Some of the dealers in supplies are at a loss to know what is in store for them, in the increase of about thirty per cent. that is being asked by some of the makers of high speed goods in the United States. It looks as though the action was general in raising the prices, although some of the makers have not forwarded official notification to their selling agencies here. Certain it is that prices are not coming down.

The finding of an exact price for a cutter for instance, has become quite a problem in mathematics recently. During the war extras were added, and to these other extras were tacked on, and fractions of extras. If one were going to compute the price of a cutter that used to be listed at \$3.35, it would be necessary to add the following (1) an extra of \$1.25, (2) another extra of \$1.25; (3) extra of half the last one, or 63c. Total these and you have the American price. Add forty per cent. (\$2.59) and the figure comes up to \$9.07, which has been all along the price at which the former \$3.35 cutter has been selling. Now comes the new price, referred to above. It costs \$9.52 to the dealer, and the chances are that by the time the machine shop gets the cutter there will be a bill of about \$11.30 against the deal. Several dealers in the city are writing away to the companies in United States to see just what has happened. It looks as though the action had been taken by all the dealers together, as several supplements are being issued to existing catalogues, and it is in these that notice is given of the increases.

Prices Come Down

It was stated in these columns a week ago that the chances were that a reduction would be announced in the price of steel plate before many days. The reduction has been made and it is possible to make \$5.50 the base price both in Toronto and Montreal for warehouse shipment. This is possible because a number of the warehouses are getting advantage of three cent deliveries from United States mills. Now that their war stock is pretty well down the new material coming in at the lower level brings down the average of all the material in stock, and the consumer is able to get the advantage of the lower rates. One of the warehouse men in Toronto stated to MACHINERY to-day: "We want to be in a position just as soon as possible to meet United States competition, and the only way to do this is to get right close to their price." Warehouses are doing a good business

now, and from general lines. In fact the trade now is very much the same as before the war.

There are some firms in Canada that developed a liking for certain lines of work during the war, and they intend to specialize in them now. For instance there is one jobbing house we have in mind. During the war contracts for marine boilers came to this place early in the game, and they got results. They got more orders and studied every step in the process very carefully, in order to make certain that their costs were not too high. Now that the war is over they intend to specialize in this line instead of jobbing. They are satisfied that they can turn out marine boilers in open competition with any firm in the

business. In fact a representative of the company is in Washington now trying to secure more business in the building of these boilers, and the chances are that he will secure the orders he needs.

Tubes Are Down

A new price list on tubes went into effect for the week's selling right at the start. The reductions average about ten to twelve per cent. Many of the Canadian warehouses are in good shape to do business at a pretty close price. They are in a good position to compete with American warehouses. There used to be two prices on tubes, one from warehouse, which was about ten per cent. or so higher than a mill delivery. Now the same price applies all around.

TRYING MANY PLANS TO TAKE WAR TOOLS OFF THE U.S. MARKETS

Special to CANADIAN MACHINERY

NEW YORK, February 27, 1919.—The War Department is busily engaged in taking inventory of the surplus machine tools, new and second hand, which it will have to dispose of. Arrangements of a definite character have been made to sell portions of this equipment to state institutions—the sales in the various states being facilitated by committees which have been appointed by the governor of each state, so that there may be a maximum amount of goods sold for state construction work—alms houses, penal institutions, city and county construction work, public utilities and various other state, county, city and borough activities.

A special effort is being made, and in some cases with success, to negotiate sales to foreign governments, the greatest volume of these sales being to Montenegro, Ecuador, Belgium and Italy, as well as to the countries in the near East. It has been found that the volume of sales to France will be somewhat limited through the existing ability of France and England to supply a considerable portion of the needs.

Special efforts will also be made to negotiate a maximum amount of sales to the United States Railroad Administration. However, not much is hoped for in this direction as the Railroad Administration will not make important purchases without the approval of the railroad purchasing departments, and this it is difficult to obtain in the present financial condition of the roads.

After the sales division of the War Department has exhausted every effort to reduce the stock of surplus tools and allied material, an effort will be made to have the manufacturer who produced the equipment take it back upon a basis later to be determined, but which, as reported in previous letters, will probably be about 75 per cent. of its present invoice price. If however, the manufacturer refuses, then all the manufacturers engaged in making similar machinery will be requested to confer regarding the purchase of it from the Government in order to protect the trade in-

terests involved. Failing in this the Government will offer the tools or other material to distributors regularly engaged in dealing in the various kinds of equipment. It is planned to eliminate speculators, brokers, scalpers and others who might improperly profit from the situation.

The machinery markets are still somewhat disturbed over the possibility of considerable machine tool equipment being dumped on the trade by the Government, but latest reports are somewhat reassuring in that the first estimates of the quantity of such equipment which the Government has on hand have been found to be greatly exaggerated.

Machinery Market Dull

The New York machinery market is dull. There are many inquiries, but few sales are being made. A new export inquiry is for quite a number of plate-working machines and allied equipment for a Japanese shipyard. Two export inquiries from France, for shipyards, are not yet acted upon. Nor has any buying been done by the Norfolk-Hampton Roads Ship Repair Corporation, which will build large dry docks and a ship repair plant at Norfolk, Virginia. The Bartlett Hayward Company, Baltimore, Md., which put out two weeks ago a large list of equipment wanted for a ship repair plant, has taken no action toward buying.

Thus it is with many of the similar inquiries which the machinery trade is receiving.

As was reported last week, the United States Shipping Board is promoting the construction by private companies, with Government aid, of 20 dry docks and ship repair plants along the Atlantic Coast. If proper arrangements can be made ten plants will be built at New York, five at Boston, three at Philadelphia, one at Charleston, South Carolina, and Pensacola, Florida. These are in addition to projects also under consideration for Norfolk, Virginia and Baltimore, Maryland. The ten New York docks would alone represent an

investment of \$25,000,000. This would include the repair plants and all machinery necessary to such enterprises.

Auto Interest Keen

The automobile industry continues to be the centre of interest for American machine-tool builders. No other industry is buying so actively. The General Motors Corporation is understood to have ambitious plans, some of which have become known. This interest has acquired the Hyatt roller bearing plant at Harrison, New Jersey, and will operate it on automobile ball bearings. It will also build a new plant at Detroit, Mich., for making automobile differentials. Considerable equipment has been bought for the Chevrolet automobile plant at Toledo, Ohio. General Motors is also in control of the Samson farm tractor plant at Janesville, Wisconsin, for which a large list of equipment will be bought.

Aside from the automobile trade, the only importing buying of machine tools is being done by the Navy Department, which is proceeding with its construction program as if the war had not stopped. The Washington Navy Yard is buying for a new torpedo station at Alexandria, Virginia.

Prices hold fairly well in most instances, but an Ohio builder of punches, shears, radial drills and other plate-working machines, has cut prices about 20 per cent. Concessions are being made here and there, but the quotations made by a majority of machine-tool builders are still on the war basis.

PIG IRON MARKET IS NOT BRISK NOW

In Some Places There is Talk of the
Furnaces Blowing Out

THE pig iron situation does not appear to be moving to any better stage at present. Although the \$31 price is generally granted by the sellers it does not seem to have brought out any more business. It is stated in several centres that stacks are going to be blown out unless there is an immediate revival in buying. Some of the reports are as follows:

New York.—Some business is moving here largely because the foundries are taking all the deliveries for which they contracted when the sellers made the reduction to them of three dollars per ton. There is a large amount of business being done in some of the foundries, and there are places where business has been turned away because firms are not able to take on any more castings.

Pittsburgh.—Some price-cutting might be done here, according to those closely in touch with the market, if there were enough business in sight to make it worth while. The market has not been tested on this score, as there have been very few inquiries. In fact some of the mills could cut prices now and still make money, but in so doing they might start something that would mean in the long run the suspension of a good many of

the high cost plants, and the laying off of men.

Chicago.—Some of the furnace yards here are piling iron because the users are asking that shipment be deferred. They cannot use the material as fast as it is being sent. There is no alarm felt yet, as the general expectation is that the iron will be absorbed within a short time. One of the largest southern producers has now come to the \$3 reduction, setting the date for this at February 1, regardless of the date and price mentioned in the contract.

HINT THAT REDUCTIONS MAY BE ANNOUNCED IN MIDDLE OF MARCH

Special to CANADIAN MACHINERY

PITTSBURGH, Feb. 27.—Buying demand in steel products is lighter than a week ago, if such a thing is possible. Mills state that practically nothing is coming in by way of new business except small "pick up" orders to piece out on something or other. Of regular orders from jobbers or manufacturing consumers there are practically none. Scarcely any steel, and no tonnage that amounts to anything, is being bought for construction purposes. This last named fact is illustrated by the monthly report of the Bridge Builders' and Structural Society, which showed that the bookings of fabricated steel jobs during January represented only 12 per cent. of the fabricating capacity for a month, this being a new low record and breaking the record of 20 per cent. bookings in November, 1914.

Conditions at the Mills

From what the mills report one could hardly estimate that current bookings are equal to 20 per cent., perhaps not 15 per cent. of the capacity, yet mill operations are, as a rule, ranging from 60 to 80 per cent. of capacity. The explanation of the divergence is that the mills are running chiefly on old orders, but as these old orders are running out rapidly there would soon be practically no work for the mills. When a mill operates at 60 or 70 per cent. of capacity the cost per ton is much above normal, but when it operates at less than 40 per cent. the cost is intolerable, so something will have to be done.

Upon the termination of the war the mills realized that it would be some time, possibly many months, before construction work, involving the use of steel, would start on a large scale and they were content to wait. They expected that meanwhile there would be a moderate demand for steel from everyday users, sufficient to maintain some sort of an operation, particularly with the aid of banked up demand that had accumulated during the period of wartime restriction in the distribution of steel. The accumulated demand has now carried the mills for about three months and apparently that is about all it is going to.

When the mills made their slight re-

Cincinnati.—Foundries are using far below normal of their melts, and as a result, shipments from the mills are being held up.

Youngstown.—England is stated to be ready to buy large amounts of basic iron, but the deal will not be put through until a much lower transportation rate can be obtained.

St. Louis.—Although the three dollar reduction has been generally granted in the south, the effect has not been to show any increase in the volume of sales made.

ductions from Government prices last December they rather thought there might be occasion to make a further reduction April 1, carrying out the principle of a quarterly consideration of prices the War Industries Board had adopted for the period of Government control. There was some talk, whether in earnest or merely for its temporary effect, that the December reductions were the last and that buyers would have to take hold at the slightly reduced prices. At any rate buyers have not done so and show no disposition to do so. At any time, of course, the mills would willingly make a substantial reduction in prices for the purpose of starting the market in full swing, which would mean getting investment buyers in also, the buyers who put up building, bridges, power stations and such like works of permanent construction, but there is no hope of getting such investment buyers in so soon, as even if the steel were cheap enough to satisfy them the cost of erection, in labor and in the materials outside of steel that are needed is altogether too high. The question for the steel mills at this time, therefore, is whether it would pay to reduce prices merely to stimulate the everyday buyer again, the jobber and ordinary manufacturing consumer. Confronted with an operation of far under 50 per cent. the mills are likely to conclude that it really will pay to make substantial reductions even though this will not of itself start construction work again.

Reductions on the Way?

Rumor has it that the steel producers have about made up their minds that substantial reductions, not like those of say \$4 or \$5 a ton last December, will have to be made, and should be made before the regular period of spring buying. It appears to be a common opinion that the lead in making reductions should be taken by one of the independents rather than by the Steel Corporation, and the prediction is that reductions will be announced the middle or latter part of March. One guesser makes it that the reduction on merchant steel bars will be \$14 a net ton, from \$2.70 to \$2.00, but that represents the extreme of the guesses.

It has been the desire of the mills to avoid any moves towards wage reductions, both because it is not considered fair to reduce wages until there has been a substantial reduction in the cost of living and because of the existing labor unrest. Just how extensive is this unrest is a matter of doubt, some observers claiming it is serious, others that it is not. It is all opinion, there being no important concrete facts upon which to base a conclusion. An item of interest in this connection, however, is the fact that three merchant blast furnaces in the Shenango valley, each acting by itself, put the matter of wages before their men, saying they could not continue to pay time and a half for overtime according to "the basic eight-hour day" principle adopted by the iron and steel trade generally last October, and giving the men time to decide whether they would prefer to work eight hours a day or 12 hours, at the straight hourly rate, and without any confusion the men decided to work 12 hours at the straight rate. Thus they will be paid per day 12 times the hour rate, which is about 42 cents, instead of 14 times that rate.

There has been a sort of mutual understanding that the matter of wage reductions would not be broached before July 1 at the earliest, but if heavy reductions in steel prices are made next month, the matter of wages will probably be brought up at that time.

As a rule buyers have no definite ideas as to the prices that would be acceptable to them and that would cause them to buy freely. Of all incentives to buying in the steel market the most cogent have always been the fear of high prices coming and the fear of deliveries being difficult to obtain. There is no conceivable reduction that would cause buyers to begin fearing at once that the next change would be an advance. As to deliveries, jobbers and manufacturing consumers do not need to carry their normal stocks, since mill shipment on new orders can be obtained almost instantly. Previous buying movements have always been supported in large part by the fact that mills were falling behind in deliveries.

One definite fact in this connection has, however, come out in the past week. Several large oil and gas interests have given to pipe mills details of pipe lines they are ready to start laying at once provided they can get the pipe at certain prices, and the prices they name are only say 10 to 20 per cent. below existing quotations. Here, at any rate, is a definite offer to begin construction work provided certain things are done as to prices. This is exceptional, but it may be a harbinger, like the first bird of spring.

Mills are operating at widely varying rates, but on the whole at lower rates than a week or a fortnight ago. A few small plants are closed entirely, while the large plants generally are running at 60 to 80 per cent. of capacity. The steel industry as a whole is probably doing between 65 and 70 per cent., but if things go on as at present they will soon be below 50 per cent.

Ingersoll Looks Ahead to Busy Days Now

The Old Noxon Plant Has Been Taken Over to House Two Good Industrial Concerns—Large Extensions Being Made to the John Morrow Plant

Special to CANADIAN MACHINERY

INGERSOLL, Feb. 26.—The question of securing houses for the families that want to move to Ingersoll is a serious matter. This place is in for a prosperous season, and the industries that are locating here are of the kind that will give steady employment to men at good wages. The closing down of the Noxon plant some time ago was an unfortunate thing for Ingersoll, and it left a large plant in a sure way to go to pieces.

At present it is being remodelled for two plants, the T. E. Bissell Co., of Elora, and the Ingersoll File Company. The latter, in fact, is the old Port Hope File Co., and the John Morrow Co. have had much to do with putting this new business in the town and making it possible for it to secure working capital necessary for expansion and growth. Both the Bissell plant and the File Co. expect that they will be operating inside of six weeks. As a matter of fact, the tool room of the Files Co. has been working for some time, and it is being added to continually.

Building Extensions

The John Morrow Co. is growing, and it is not any mushroom growth either. The extensions being made to the plant are the very latest word in factory extension, and have been built to take care of an expansion that has been forcing the present plant beyond its capacity limits for some time. In the extensions that are taking place, due consideration is also being given to the proper routing of work, so that there will be a correct sequence of operations from the raw product to the inspection and shipping departments. One of the most advanced ideas is to be seen in the erection of a large cafeteria and rest room, especially for the women workers in the plant. This department is especially designed for light and air, and the lounging room, which is to be placed at the disposal of the women, is a model of simplicity and comfort.

The immense battery of automatics in this plant, as well as the machines of special design in the department turning out drills of all sorts, are working to capacity. In fact overtime is being resorted to three nights a week in order that the plant may keep up with the orders that are coming in. When the additions to the factory are completed and machinery installed, it is likely that there will be about 600 automatics in operation.

Mr. Horton, of the John Morrow Co., stated to CANADIAN MACHINERY that business with their firm was good, even since the war had come to a close. "We are, in some departments of our business, as far as three months behind

in our orders. On export business," stated Mr. Horton, "we are not making much progress, although we have a number of customers, especially in Australia, and we still look after them." The securing of the necessary supply of steel is an easier matter now than when the war was in progress.

The Ingersoll File Co.

The northern portion of the old Noxon plant is being used to house the Ingersoll File Co. Mr. H. Swallow, the president and manager of the company, has been in Ingersoll for some time getting things into shape, and a large number of men are engaged in tearing down and rebuilding in order that nothing may be lacking when the place is finally ready for operation. In the rebuilding of the factory every care is being taken that the various operations from the forging room through to boxing and shipping shall be laid out so that there shall be no extra carting or handling of the files in any stage of their progress through the plant. The material used is high carbon crucible steel of about 1.40 per cent. carbon. The machines for the forging rooms are in the premises and will be installed as soon as the floors are ready. E. H. Fogarty Jr., who has had charge of the forging room of the Port Hope Co., is superintending the work here, and expects to be ready to start the first operations shortly.

In the cutting room every precaution is being taken against jarring or rattling. In the first place this room has a splendid north light along the river. The floor is of concrete, and on this is a wood block floor, making a desirable place for people to work. The pedestal foundations for a large number of the machines that must have absolute rigidity in operation are being constructed. In this, the cutting room, there will be about sixty machines in operation, with a capacity of from 30 to 100 dozen files a day each. The single-purpose idea is put into operation here, as each size file has a certain number of machines reserved for that purpose. It has been found, after experiment and study, that it pays much better to keep a machine standing ready all the time for a certain size of work than to change them over for a number of varieties and sizes.

Make Their Own Machinery

And, speaking of machines, it is well to mention that all the machines used in the cutting room and in other parts of the factory are built right on the premises as there is no place where they can be purchased. For this reason it is necessary to keep a well-equipped tool room in operation.

The preparation of the floor in the grinding room, the building of the pits for the large grinding wheel bearings, etc., has been completed, and these will soon be ready for work. There are eight of these pits built of solid concrete. The grinding stones used in this room weigh about 5,200 pounds each, and run about 750 r.p.m. These stones not only have the ordinary rotary motion, but they travel from side to side about 18 inches in order that the working face may be evenly covered. The lifetime of a grinding stone in a files factory is about ten days or two weeks. Recently the price of these has gone up about 100 per cent., largely on account of the scarcity of labor. It is necessary that, after being taken from the quarries, they should be seasoned from twelve months to two years. Just recently the file company contracted for \$14,000 worth of grinding stones. "There is something where a person can make a fortune," stated Mr. Swallow. "Let some good mechanic come along and solve the problem of doing away with grinding in the making of files; our company or any other file company will be pleased to do business with him on very generous lines."

Much Building Yet

Work is well under way in the construction of a battery of annealing ovens in which fuel oil will be burned under pressure. The power house now boasts a new brick stack, and fire is being put under the boilers. The compressors, etc., will be installed shortly, but electricity will be used as the motive power.

There is a great future for the file business, according to Mr. Swallow. "We sell principally in this country, although we will be in a position before very long to pay more attention to the matter of exporting. We had one order not very long ago that was worth \$18,000 and it came from Sheffield, the home of the file-making business. It was repeat business, and when this order came all it asked for was, 'best, as before.' We took that to be one of the finest compliments that could be paid to our goods. We never have any trouble in selling all the files we can make."

Making a Rest Room

One of the upstairs rooms, formerly part of the stock room of the Noxon shop, is going to be fitted up as a rest room for the women who will be employed in the works. A cafeteria will also be put in for the convenience of the workers. The works will be in operation in about six weeks, with forty hands. It is expected that inside of the first year this will be increased to 125. The File

Continued on page 64

SELECTED MARKET QUOTATIONS

Being a record of prices current on raw and finished material entering into the manufacture of mechanical and general engineering products.

PIG IRON

Grey forge, Pittsburgh	\$31 40
Lake Superior, charcoal, Chicago	38 85
Standard low phos., Philadelphia	33 60
Bessemer, Pittsburgh	33 60
Basic, Valley furnace	30 00

Government prices

	Montreal	Toronto
Hamilton		
Victoria		

IRON AND STEEL

Per lb. to Large Buyers.

	Cents
Iron bars, base, Toronto	\$ 4 75
Steel bars, base, Toronto	5 00
Steel bars, 2 in. to 4 in. base	6 00
Steel bars, 4 in. and larger base	7 00
Iron bars, base, Montreal	4 55
Steel bars, base, Montreal	5 05
Reinforcing bars, base	4 50
Steel hoops	7 50
Norway iron	11 00
Tire steel	5 50
Spring steel	8 00
Brand steel, No. 10 gauge, base	5 05
Chequered floor plate, 3-16 in.	12 20
Chequered floor plate, ¼ in.	12 00
Staybolt iron	11 00
Bessemer rails, heavy, at mill	
Steel bars, Pittsburgh	2 70
Tank plates, Pittsburgh	3 00
Structural shapes, Pittsburgh	2 80
Steel hoops, Pittsburgh	3 30

F.O.B., Toronto Warehouse

Steel bars	5 50
Small shapes	5 75
F.O.B. Chicago Warehouse	
Steel bars	4 10
Structural shapes	4 20
Plates	4 45

FREIGHT RATES

	Per 100 lbs.	C.L.	L.C.L.
Pittsburgh to Following Points			
Montreal	29	39½	
St. John, N.B.	47½	63	
Halifax	49	64½	
Toronto	23½	27½	
Guelph	23½	27½	
London	23½	27½	
Windsor	23½	27½	
Winnipeg	81	106½	

METALS

Lake copper	\$23 00	\$ 22 00
Electro copper	22 00	22 00
Casting, copper	22 00	20 00
Tin	62 00	62 00
Spelter	9 50	8 50
Lead	8 00	6 50
Antimony	9 00	8 50
Aluminum	40 00	40 00

Prices per 100 lbs.

PLATES

	Montreal	Toronto
Plates, ¼ up	\$ 5 50	\$ 5 50
Plates, 3-16 in.	5 75	5 75

Per 100 lbs.

Price List No. 38

Standard Buttwell

	Per 100 feet	
¼ in.	\$ 6 00	\$ 8 00
½ in.	4 68	6 81
¾ in.	4 68	6 81
1 in.	6 21	7 78
1¼ in.	7 82	9 95
1½ in.	11 56	14 71
2 in.	15 64	19 90
2½ in.	18 70	23 76
3 in.	25 16	32 01

2½ in.	40 37	51 19
3 in.	52 79	66 94
3½ in.	67 16	84 18
4 in.	79 57	99 74

Standard Lapweld

2 in.	38 81	35 34
2½ in.	42 12	52 36
3 in.	55 08	68 47
3½ in.	69 00	86 94
4 in.	81 75	103 00
4½ in.	93	1 18
5 in.	1 08	1 37
6 in.	1 40	1 78
7 in.	1 83	2 32
8L in.	1 93	2 44
8 in.	2 22	2 81
9 in.	2 66	3 36
10L in.	2 46	3 12
10 in.	3 17	4 02

Terms 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Prices—Ontario, Quebec and Maritime Provinces.

WROUGHT NIPPLES

4" and under, 45%.	
4½" and larger, 40%.	
4" and under, running thread, 25%.	
Standard couplings, 4" and under, 35%.	
4½" and larger, 15%.	

OLD MATERIAL

Dealers' Buying Prices.

	Per 100 Pounds	
	Montreal	Toronto
Copper, light	\$13 00	\$13 00
Copper, crucible	16 50	15 00
Copper, heavy	15 00	15 00
Copper wire	15 00	15 00
No. 1 machine composition	14 50	14 00
New brass cuttings	10 00	10 00
Red brass turnings	11 00	10 00
Yellow brass turnings	8 00	8 00
Light brass	6 00	7 50
Medium brass	9 00	9 00
Scrap zinc	5 50	5 00
Heavy lead	3-4	5 00
Tea lead	2-3	3 50
Aluminum	18 00	12 00

Per Ton

Heavy melting steel	15 00	14 00
Shell turnings	8 00	6 00
Boiler plate	14 00	11 00
Axles (wrought iron)	20 00	15 00
Rails	20 00	11 00
Malleable scrap	15 00	13 00
No. 1 machine cast iron	18 00	14 00
Pipe wrought	9 00	7 00
Car wheels	20-22	18 00
Steel axles	22 00	20 00
Mach. shop turnings	6 00	6 00
Stove plate	14 00	14 00
Cast boring	8 00	8 00

BOLTS, NUTS AND SCREWS

	Per Cent
Carriage bolts, ¾" and less	10
Carriage bolts, 7-16 and up	net
Coach and lag screws	25
Stove bolts	55
Plate washers	List plus 20
Elevator bolts	5
Machine bolts, 7-16 and over	net
Machine bolts, ¾" and less	10
Blank bolts	net
Bolt ends	net
Machine screws, fl. and rd. hd., steel	27½

Machine screws, o. and fl. hd., steel	10
Machine screws, fl. and rd. hd., brass	add 20
Machine screws, o. and fl. hd. brass	add 25
Nuts, square blank	add \$1 50
Nuts, square, tapped	add 1 75
Nuts, hex., blank	add 1 75
Nuts, hex., tapped	add 2 00
Copper rivets and burrs, list plus	30
Burrs only, list plus	50
Iron rivets and burrs	25
Boiler rivets, base ¾" and larger	\$8 50
Structural rivets, as above	8 40
Wood screws, flat, bright	72½
Wood screws, O. & R., bright	67½
Wood screws, flat, brass	37½
Wood screws, O. & R., brass	32½
Wood screws, flat, bronze	27½
Wood screws, O. & R., bronze	25

MILLED PRODUCTS

	Per Cent
Set screws	25
Sq. & Hex. Head Cap Screws	20
Rd. & Fil. Head Cap Screws	net
Flat But. Hd. Cap Screws	plus net
Fin. & Semi-fin. nuts up to 1 in.	25
Fin. & Semi-fin. nuts, over 1 in., up to 1½ in.	20
Fin. & Semi-fin. nuts over 1½ in., up to 2 in.	plus 10
Studs	net
Taper pins	40
Coupling bolts, plus	10
Planer head bolts, without fillet, list plus	10
Planer head bolts, with fillet, list plus 10 and	10
Planer head bolt nuts, same as finished nuts.	
Planer bolt washers	net
Hollow set screws	list plus 20
Collar screws	list plus 30, 10
Thumb screws	20
Thumb nuts	65
Patch bolts	add 40, 10
Cold pressed nuts to 1½ in.	add \$4 50
Cold pressed nuts over 1½ in.	add 7 00

BILLETS

	Per gross ton
Bessemer billets	\$43 50
Open-hearth Billets	43 50
O.H. sheet bars	47 00
Forging billets	56 00
Wire rods	57 00

Government prices.

F.O.B. Pittsburgh.

NAILS AND SPIKES

Wire nails	\$5 50	\$5 30
Cut nails	5 85	5 65
Miscellaneous wire nails		60%
Spikes, ¾ in. and larger		\$7 50
Spikes, ¾ and 5-16 in.		8 00

ROPE AND PACKINGS

Drilling cables, Manila	0 39
Plumbers' oakum, per lb.	0 10
Packing, square braided	0 38
Packing, No. 1 Italian	0 44
Packing, No. 2 Italian	0 36
Pure Manila rope	0 37
British Manila rope	0 31
New Zealand hemp	0 31
Transmission rope, Manila	0 43
Cotton rope, ¼-lb. and up	0 74

POLISHED DRILL ROD

Discount off list, Montreal and Toronto	net
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MISCELLANEOUS

Solder, strictly	0 34
Solder, guaranteed	0 39
Babbitt metals	18 to 70
Soldering coppers, lb.	0 58
Lead wool, per lb.	0 14
Putty, 100-lb. drums	6 75
White lead, pure, cwt.	17 80
Red dry lead, 100-lb. kegs, per cwt.	15 50
Glue, English	0 35
Tarred slater's paper, roll ...	1 30
Gasoline, per gal., bulk	0 33
Benzine, per gal., bulk	0 32
Pure turpentine, single bbls., gal. 1	1 10
Linseed oil, raw, single bbls. ..	1 70
Linseed oil, boiled, single bbls. ..	1 73
Plaster of Paris, per bbl.	4 50
Sandpaper, B. & A.	List plus 43
Emery cloth	list plus 37½
Sal Soda	0 03½
Sulphur, rolls	0 05
Sulphur, commercial	0 04½
Rosin "D," per lb.	0 07
Rosin "G," per lb.	0 08
Borax crystal and granular....	0 14
Wood alcohol, per gallon	2 00
Whiting, plain, per 100 lbs.	2 50

CARBON DRILLS AND REAMERS

	Per Cent.
S.S. drills, wire sizes up to 52 ..	35
S.S. drills, wire sizes, No. 53 to 80	40
Standard drills to 1½ in.	40
Standard drills, over 1½ in.	40
3-fluted drills, plus	10
Jobbers' and letter sizes	40
Bit stock	40
Ratchet drills	15
S.S. drills for wood	40
Wood boring brace drills	25
Electricians' bits	30
Sockets	40
Sleeves	40
Taper pin reamers	net
Drills and countersinks	list plus 40
Bridge reamers	50
Centre reamers	10
Chucking reamers	net
Hand reamers	10
High speed drills, list plus	75
High speed cutters, list plus	40

COLD ROLLED SHAFTING

At mill	list plus 40%
At warehouse	list plus 60%
Discounts off new list. Warehouse price at Montreal and Toronto	

IRON PIPE FITTINGS

Malleable fittings, class A, 20% on list; class B and C, net list. Cast iron fittings, 15% off list. Malleable bushings, 25 and 7½%; cast bushings, 25%; unions, 45%; plugs, 20% off list. Net prices malleable fittings; class B black, 24½c lb.; class C black, 15½c lb.; galvanized, class B, 34c lb.; class C, 24½c lb. F.O.B. Toronto.

SHEETS

	Montreal	Toronto
Sheets, black, No. 28..	\$ 7 00	\$ 6 50
Sheets, black, No. 10..	6 50	6 00
Canada plates, dull, 52 sheets	8 50	8 10
Can. plates, all bright	8 50	9 50
Apollo brand, 10¼ oz. galvanized		
Queen's Head, 28 B.W.G.		
Fleur-de-Lis, 28 B.W.G.		
Gorbal's Best, No. 28.		
Colborne Crown, No. 28		
Premier, No. 28 U.S.	8 20	
Premier, 10¼ oz.	8 50	
Zinc sheets	20 00	20 00

PROOF COIL CHAIN

B
¼ in., \$14.35; 5-16 in., \$13.85; ¾ in., \$13.50; 7-16 in., \$12.90; ½ in., \$13.20;

\$13.00; ¾ in., \$12.90; 1 inch, \$12.65; Extra for B.B. Chain, \$1.20; Extra for B.B.B. Chain, \$1.80.

ELECTRIC WELD COIL CHAIN B.B.

¾ in., \$13.00; 3-16 in., \$12.50; ¼ in., \$11.75; 5-16 in., \$11.40; ¾ in., \$11.00; 7-16 in., \$10.60; ½ in., \$10.40; ¾ in., \$10.00; ¾ in., \$9.90.

Prices per 100 lbs.

FILES AND RASPS.

	Per cent.
Globe	50
Vulcan	50
P.H. and Imperial	50
Nicholson	32½
Black Diamond	32½
J. Barton Smith, Eagle	50
McClelland, Globe	50
Delta Files	20
Disston	40
Whitman & Barnes	50

BOILER TUBES.

Size	Seamless	Lapwelded
1 in.	\$28 00	\$.....
1¼ in.	32 00	
1½ in.	35 00	28 00
1¾ in.	35 00	28 00
2 in.	40 00	28 00
2¼ in.	43 00	30 00
2½ in.	45 00	35 00
3 in.	52 00	40 00
3¼ in. ....	.....	47 00
3½ in.	62 00	48 00
4 in.	70 00	60 00

Prices per 100 ft., Montreal and Toronto less 10.

OILS AND COMPOUNDS.

Castor oil, per lb.	
Royalite, per gal., bulk	19½
Palacine	22½
Machine oil, per gal.	27½
Black oil, per gal.	16
Cylinder oil, Capital	52
Cylinder oil, Acme	39½
Standard cutting compound, per lb. 0	06
Lard oil, per gal.	\$2 60
Union thread cutting oil antiseptic	88
Acme cutting oil, antiseptic	37½
Imperial quenching oil	39½
Petroleum fuel oil, bbls. net	10¼

BELTING—NO. 1 OAK TANNED.

Extra heavy, single and double..	30%
Standard	30,10%
Cut leather lacing, No. 1	2 20
Leather in sides	1 75

TAPES.

Chesterman Metallic, 50 ft.	\$2 00
Lufkin Metallic, 603, 50 ft.	2 00
Admiral Steel Tape, 50 ft.	2 75
Admiral Steel Tape, 100 ft.	4 45
Major Jun. Steel Tape, 50 ft.	3 50
Rival Steel Tape, 50 ft.	2 75
Rival Steel Tape, 100 ft.	4 45
Reliable Jun. Steel Tape, 50 ft.	3 50

PLATING SUPPLIES.

Polishing wheels, felt	3 25
Polishing wheels, bull-neck..	2 00
Emery in kegs, American....	07
Pumice, ground	3½ to 05
Emery glue	28 to 30
Tripoli composition	06 to 09
Crocus composition	08 to 10
Emery composition	08 to 09
Rouge, silver	35 to 50
Rouge, powder	30 to 45

Prices Per Lb.

ARTIFICIAL CORUNDUM

Grits, 6 to 70 inclusive .....	.08½
Grits, 80 and finer .....	.06

BRASS

Brass rods, base ½ in. to 1 in. rod	0 38
Brass sheets, 24 gauge and heavier, base	0 43

Brass tubing, seamless	0 46
Copper tubing, seamless	0 48

WASTE

White	Cts. per lb.
XXX Extra..19½	Atlas .....17
Peerless .....19	X Empire ....15½
Grand .....18	Ideal 16
Superior .....18	X press .....14
X L C R .....17	

Colored.

Lion	15	Popular	12
Standard	13½	Keen	10½
No. 1	13½		

Wool Packing.

Arrow	25	Anvil	15
Axle	20	Anchor	11

Washed Wipers.

Select White. 11	Dark colored. 09
Mixed colored 10	

This list subject to trade discount for quantity.

RUBBER BELTING.

Standard ... 10%	Best grades .. 15%
------------------	--------------------

ANODES.

Nickel .....	.58 to .65
Copper .....	.38 to .45
Tin .....	.70 to .70
Zinc .....	.18 to .18

Prices Per Lb.

COPPER PRODUCTS.

	Montreal	Toronto
Bars, ½ to 2 in.	42 50	43 00
Copper wire, list plus 10 ..		
Plain sheets, 14 oz., 14x60 in.	46 00	44 00
Copper sheet, tinned, 14x60, 14 oz.	48 00	48 00
Copper sheet, planished, 16 oz. base	46 00	45 00
Braziers, in sheets, 6x4 base	45 00	44 00

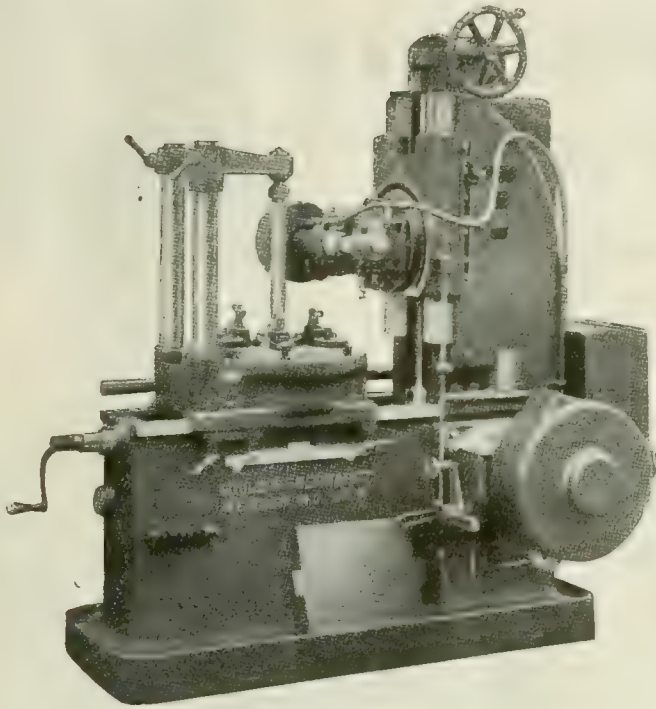
LEAD SHEETS.

	Montreal	Toronto
Sheets, 3 lbs. sq. ft.	\$13 25	\$13 25
Sheets, 3½ lbs. sq. ft. ..	13 25	13 25
Sheets, 4 to 6 lbs. sq. ft.	12 50	12 50
Cut sheets, ½c per lb. extra.		
Cut sheets to size, 1c per lb. extra.		

PLATING CHEMICALS.

Acid, boracic	\$.25
Acid, hydrochloric .....	.06
Acid, nitric .....	.14
Acid, sulphuric .....	.06
Ammonia, aqua .....	.23
Ammonium carbonate .....	...
Ammonium chloride .....	.55
Ammonium hydrosulphuret .....	.30
Ammonium sulphate .....	.15
Arsenic, white .....	.27
Copper, carbonate, annhy .....	.50
Copper, sulphate .....	.22
Cobalt, sulphate .....	.20
Iron perchloride .....	.40
Lead acetate .....	.35
Nickel ammonium sulphate .....	.25
Nickel carbonate .....	.32
Nickel sulphate .....	.35
Potassium carbonate	1.80
Potassium sulphide (substitute)	2 25
Silver chloride (per oz.)	1.45
Silver nitrate (per oz.)	1.20
Sodium bisulphite .....	.15
Sodium carbonate crystals .....	.05
Sodium cyanide, 127-130% .....	.40
Sodium hydrate .....	.22
Sodium hyposulphite, per 100 lbs.	6.00
Sodium phosphate .....	.18
Tin chloride	1.75
Zinc chloride, C.P. ....	.80
Zinc sulphate .....	.15

Prices per lb. unless otherwise stated.



Gould & Eberhardt Gear Hobbers

For cutting Spur, Helical and Worm
Gears up to 120" dia. Also

Multiple Spindle, Continuous Operation Automatic Roughing Machines for large production.

Put your gear-cutting problems up to us. Catalog on request.

Write for prices and deliveries.

A. R. Williams Machinery Company, Limited

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WINNIPEG, VANCOUVER

If It's Machinery, Write Williams''

64 W. FRONT STREET
TORONTO

Acid Electric STEEL CASTINGS

Acid Electric Steel Castings show superior ability to resist wear and crystallization. They are smooth in texture, free from Blow Holes, and machine perfectly. We specialize in

Railroad and Other High Grade Castings

up to 15 tons, any specification. Electric Steel Castings COST NO MORE than ordinary Steel Castings.

Prices on Application—Prompt Deliveries

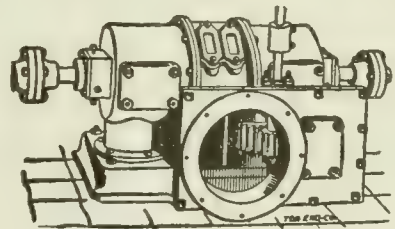
The Thos. Davidson Mfg. Co., Limited

Steel Foundry Division, Lachine Canal

Head Office: 187 Delisle St. MONTREAL

Phone Victoria 1492

WATER POWER DEVELOPMENT



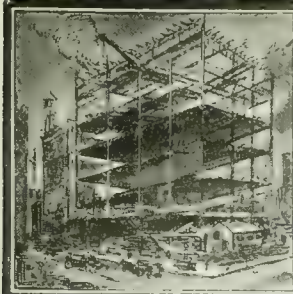
Over forty years' experience in designing and installing special turbines, both on vertical and horizontal shafts.

Can supply complete equipment, including flume, turbine and power transmission.

Stock of standard vertical shaft Little Giant Turbines on hand for prompt shipment.

We solicit your inquiries.

J. C. WILSON & CO.
BELLEVILLE, ONTARIO



INDUSTRIAL NEWS

NEW SHOPS, TENDERS AND CONTRACTS
PERSONAL AND TRADE NOTES



ENGINEERING

Quebec.—The International Paper Company of New York has decided upon the erection of a huge plant at Three Rivers, Quebec. Six million dollars, it is said, will be spent on this paper plant, that will be in the very heart of the wood and pulp industry of the valley of the St. Maurice River, for years noted for its extensive log-driving operations. More than 3,000 workers will be employed there, and the entire plant will cover an area of 100 acres.

MARINE

Quebec.—The National Shipyard Corporation, having vast plants at Three Rivers, is at present working on the construction of ten large wooden vessels. Eight hundred men work there, and it is expected the vessel will be launched by the end of April.

Victoria.—With four hulls at the Foundation yards ready for the commencement of caulking operations, the edict went forth that a start would be made in plugging up the seams, and the caulkers were told off to warm up for the occasion. Instead of getting down to business, however, they put in a demand for an increase in wages, which the company was not disposed to consider in view of the fact that the wages paid to all crafts in the yards comply with the provisions of the Robertson agreement, to which the Caulkers' Union is a party. Under the Robertson agreement the caulkers are entitled to \$7.70 per day, and with the revision of the wage schedules, according to the increase on the cost of living the daily wage of a caulker has been boosted to \$8.08. The caulkers, however, demand that they be paid a scale of \$8.50. Apparently the men of the other crafts are not in sympathy with the caulkers and there seems to be a lack of unanimity on the score of a raise among the caulkers themselves.

MUNICIPAL

Brockville.—J. Amos Johnston, manager of the Public Utilities Department, has been appointed to the position of industrial commissioner for the town of Brockville. A number of tentative propositions, looking to the establishment of new industries, are under consideration, and these will be taken up at once by the new official.

Hull, Que.—The City of Hull has undertaken a publicity campaign with the object of bringing its advantages to the attention of American and Canadian capitalists, as possessing qualifications which render it a favored place for the founding of industries. The city has promised consideration to new industries and the council has authorized the expenditure of \$20,000 in a publicity campaign.

Markham.—Markham Village passed a by-law for \$5,000 to bring Hydro power to the village. Of 108 voters, 107 voted for the Hydro. Markham has at present a local power plant, so all that will be necessary is to bring the power from Agincourt and turn it on to the local wires. Markham will then have a 24-hour service instead of a 5-hour

service as at present, and the cost will be reduced both for users and non-users, who only pay for street lighting.

Montreal.—The City of Montreal is to be authorized to appoint a commission of at least three members, or a director of housing, for the purpose of taking advantage of the Federal loan for the construction of houses in the city. The loan from the Dominion Government is to be repayable in twenty or thirty years, at the rate of five per cent. The housing scheme provides for loans of from \$3,000 to \$4,500, these figures to include the planning and laying out of the lots, together with the cost of the building.

Chatham.—Representatives of the Montreal firm which manufactures the motorized Elgin street cleaner were in the city and discussed with city officials the merits of this machine, and to what good use it could be applied in the city. The representatives held consultations with Mayor Hammond, Alderman Fitzsimmons, chairman of the Board of Works, and City Engineer Shackleton. It is understood there is some opposition to the purchase in certain sections of the city, and that a petition is being circulated protesting against the purchase of such a machine.

Montreal.—A delegation, appointed by the Administrative Commission of Montreal, will visit some of the cities of the United States to study modern methods of street cleaning and snow removal. This civic delegation will also attend the meetings of the American Road Builders' Association in New York on Feb. 25-28. The purpose of the investigation is to study whether American methods of road-making and road-repairing can be economically adapted to local conditions. Two engineers of the city Public Works Department will be representatives on the committee.

PERSONAL

Thomas W. Pangborn, president Pangborn Corporation, has been elected a director of the Maryland Surety & Trust Co., Hagerstown, Md., one of the largest financial institutions in the State.

Mr. Frank James has been appointed to the position of assistant to F. L. Hutchinson, manager-in-chief of C. P. R. hotels, with headquarters at Windsor street. Previous to his appointment, Mr. James was secretary-treasurer of the

BUSINESS MAN DIES WHILE IN ENGLAND

J. J. Harty, President Canadian Locomotives, Was Away on Business Trip

Kingston.—A cablegram was received in the city stating that Dr. J. J. Harty, president of the Canadian Locomotive Company, had died in London, England, of pneumonia.

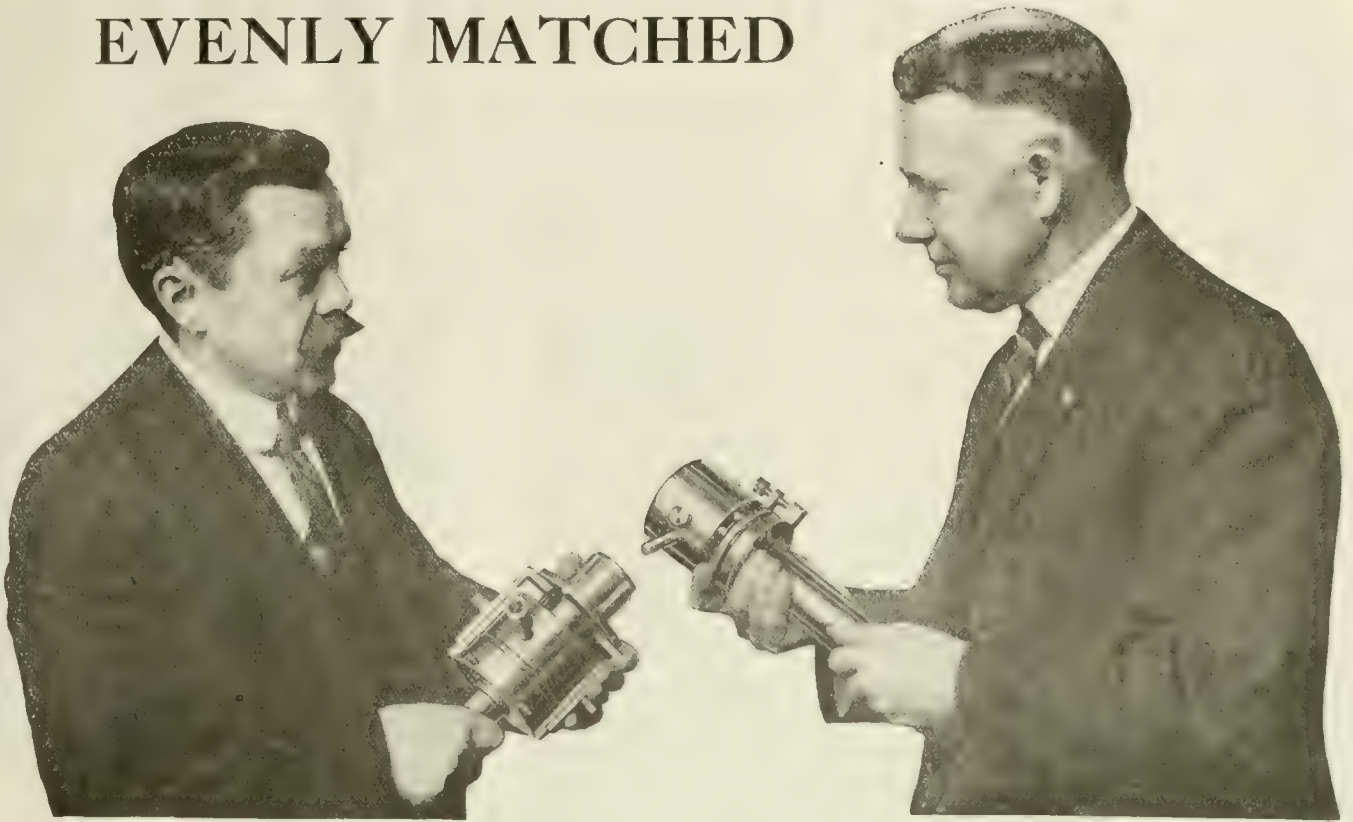
Dr. Harty left on January 29 for England, his object being to secure orders, if possible, for his company.

A few days ago a cablegram was received to the effect that he had bronchitis, but would be around in a few days. Last night another cablegram said that he was dangerously ill, and this morning the news came he had passed away at the Savoy, the cause of death being pneumonia.

Dr. Harty was a son of Hon. William Harty, of this city, formerly president of the Locomotive Company, and for many years was connected with the Locomotive Company, first as secretary, next as general manager and lastly as president. He graduated in Medicine in 1897 from Queen's, but never practised. He took a prominent part in college athletics, and in his day was one of the best hockey players in the country. He kept up his interest in sport, especially hockey.

Dr. Harty's only brother, Staff-Major William Harty, who was overseas during the greater part of the war, was with him when he died.

EVENLY MATCHED



The man who is tapping internal screw threads with a Geometric Collapsing Tap is evenly matched with the one who is cutting external screw threads with a Geometric Self-opening Die Head.

Commenting on the policy of **THREADS**, the monthly publication of The Geometric Tool Company, a London supporter of the Geometric method says:

"The policy you advocate as to work is good, yet you are inconsistent in making a tool that avoids it."

Geometric Self-Opening Die Heads and Collapsing Taps

Help You to Avoid Work by Doing It for You

The Geometric Catalogue will tell you how.

THE GEOMETRIC TOOL COMPANY
NEW HAVEN **CONNECTICUT**

Canadian Agents: Williams & Wilson, Limited, Montreal; The A. R. Williams Machinery Co., Limited, Toronto, Winnipeg and St. John, N.B.

Ritz-Carlton Hotel Company of Montreal.

Thomas McQuat, head of the firm of McQuat and Son, founders, died recently at his home in Lachute, P.Q. Early in his 'teens Mr. McQuat entered the services of the Victoria Foundry, Ottawa, and at the age of 29, when he had attained the position of foreman pattern-maker and machinist of that establishment, he and the foreman molder, John McRae, came to Lachute and established the foundry firm which was known as McQuat and McRae until 1903, at which time Mr. McRae withdrew his interests from the business.

TRADE GOSSIP

Armstrong, B.C., will erect a hospital. Carleton Co. is to spend \$40,000 on good roads.

Brantford Tp. is to spend \$4,500 for culverts.

St. Michael's Church, Kingston, will build a hospital.

Hospital for Insane, Brockville, will erect \$30,000 addition.

Estevan, Sask., may spend \$12,000 for waterworks extensions.

Guelph is having plans prepared for a sewage disposal plant.

The Orphanage at Kitchener will build additions to cost \$5,000.

W. H. Fairchild, of Galt, is now manager of all the public utilities of that city.

Public Works Department are going to erect a structural steel bridge at Spencerville, for \$10,000.

At Orillia, kitchen, laundry, power house and tubercular hospital will be built. All cost about \$70,000.

Salvation Army Hospital to be built at Toronto will cost \$125,000. Tenders may be called for about May 1.

Nurses' home, \$40,000, and wing to infirm hospital, \$40,000. That is what plans call for at London. Dept. of Public Works, Toronto, have particulars.

Sarnia is calling for tenders for erection of a garbage incinerator in three contracts: (1) radical brick stack, 125 feet; (2) building with reinforced concrete approaches; (3) furnace, flues etc. J. D. Stewart is city clerk of Sarnia.

Changes at Polson's.—According to reports reaching CANADIAN MACHINERY just as the paper was going to press, the Polson Iron Works, Toronto, has been sold, but to whom, we are not able to state. The new manager, Mr. Forbes, was introduced to the staff this week.

Pledged to Help.—At a dinner at the Galt Club, attended by the majority of the manufacturers, delegates from the Great War Veterans' Association and the executive of the Soldiers' Aid Commission, and held under the auspices of the latter organization, various repatriation questions as they affect Galt locally were

thoroughly discussed. Manufacturers promised co-operation in returning soldiers to civil life, and all were unanimous regarding the prospects for a great future for Galt.

Have Own Men.—In a communication received by the Canadian Trade Commissioner in Ottawa from the Canadian mission in London, emphasis was placed on the necessity of individual firms in Canada appointing their own representatives to cultivate the foreign field for anticipated export trade. The Canadian mission will willingly co-operate with home firms, but reiterates the practical impossibility of their carrying out actual agency work for individual Canadian interests.

Opening New Office.—The Cleveland Pneumatic Tool Co., Canada, Ltd., announce the opening of a Montreal office on March 1 at 337 Craig St. West. A

SPEAK SPARINGLY OF WAGE REDUCTION

Steel Men Feel That Price Uncertainty Is Holding Back Business

A Canadian official who has just returned from the annual gathering of managers of the United States Steel Products, which is the export branch of the steel corporation, says that the consensus of opinion seemed to be at that gathering that there would be keen competition for all the business that was offering. This would be due, principally, to the very large capacity of the plants of the United States, as well as to the additions and extensions that had been made under the stress of war in Britain and other countries. The question of prices is unsettled, and it is a matter that those at the meeting were inclined to say little about, beyond admitting that the uncertainty of which way things would go was holding back a lot of business. Another thing brought out was the feeling that a slight price concession would do nothing whatever toward bringing any new business to the point of actual placing.

Costs Serious Problems

The matter of costs is going to become a serious problem very shortly. Labor is still at war levels, and the steel concerns do not want to take the first step to force wages down as long as other costs that draw on the men's salaries remain at their high levels.

It is understood that the Canadian plant of the corporation at Ojibway is hung up on account of the excessive amounts that would be involved in going ahead with the plant at the moment. Officials of the corporation take the position that whatever they invest in the plant is a permanent charge, and if it is very high it will make that much more to work against to make a profit every year. The work may go along slowly, but until there is a more tempting labor cost it is unlikely that anything will be done on a scale in keeping with the size of the undertaking.

complete line of Cleveland pneumatic tools, parts and appliances, "Veribest" air hose, Bowes' couplings, etc., will be stocked. It is also the intention to maintain a fully equipped repair shop or service station. C. D. Garner will have charge of the office, the same as Toronto, and A. M. White, a former mechanical expert from the factory, will be the Montreal representative.

A Hopeful Sign.—The better co-operation that is being manifest between capital and labor was amply illustrated at a recent dinner of the Canadian Manufacturers' Association held at the Ritz-Carlton in Montreal, when Tom Moore, president of the Allied Trades and Labor Congress, was the guest of honor and speaker of the evening. The dinner was presided over by Walter Sadler, the president of the association. Mr. Moore emphasized the fact that the civilization of the future would be what we make it, and that the time had come when labor and capital should join hands in solid friendship for the betterment of trade conditions and humanity in general.

Road-Making Machinery.—Road-making machinery is expected to be in much larger demand during the coming season than it has been for several years. The large programme of road construction that is being entered upon in different sections of the country promises to broaden this market considerably. Only a relatively small percentage of the capacity of plants engaged in this line of manufacture is devoted to the production of such machinery, as it is felt that the Canadian market is too limited to provide great scope. An accession of activity in this department would be of fair importance, and, judging from the prospective programmes already laid down, there will be considerably larger demands on manufacturers than in the past.

New Incorporations.—Joint stock companies incorporated include the following: Shannon Fisheries, Ltd., Montreal, capital \$45,000; The Fireless Cooker Co., of Canada, Ltd., Hull, capital \$10,000; Thornton, Davidson and Co., Ltd., Montreal, capital \$100,000; R. Percy Sims, Ltd., Montreal, capital \$20,000; Joseph Papin, Ltd., Contrecoeur, Que., capital \$75,000; Merritt and Co., Ltd., Chatham, capital \$75,000; P. J. Dwyer, Molybdenite, Ltd., Toronto, capital \$350,000; Henri Peladeau, Ltd., Montreal, capital \$99,000; Canadian Fishing and Transport Co., Ltd., Toronto, capital \$1,500,000; Canadian Kraft, Ltd., Montreal, capital \$100,000; International Button Co., Montreal, capital \$100,000; Chats Falls Navigation Co., Ltd., Ottawa, capital \$50,000; War Publications, Ltd., Ottawa, capital \$50,000; Atlas Bond and Security Corporations, Ltd., Montreal, capital \$50,000.

CATALOGUES

The Fitchburg Grinding Machine Company, Fitchburg, Mass., have issued a catalogue descriptive of their line of

DO your Tapping 10 Times Faster

Hand-tapping is an expensive practice you can now eliminate. It is no longer essential to the perfection of your product. With this Aikenhead's Wahlstrom Automatic Tapping attachment, tap holes as squarely as they could be drilled.



Wahlstrom Automatic Tapping Attachment

is constructed of hardened and ground steel parts throughout, and has nothing whatever that can get out of order. An oscillating movement mechanically obtained imitates hand-tapping, though 10 times faster, and reduces tap breakage to the very minimum.

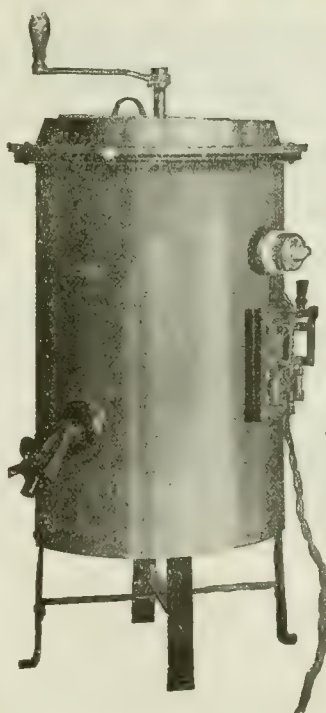
Attached to any type of drill press, this Wahlstrom device will pay its cost in short order. Built for taps of all sizes up to 1/2-inch.

Aikenhead Hardware Ltd.

17, 19, 21 Temperance Street
Toronto, Canada

Aikenhead's Electric Glue Heaters

for Woodworking and Pattern Shops



Wherever it is realized that glue has the greatest "sticking" strength when maintained at a temperature of 145 to 150 degrees Fhr., the merits of "International" Electric Glue Heaters are quickly acknowledged. For these Heaters, operating on **dry heat**, utilizing every bit of the heat generated because conserving it on the fireless cooker principle, keeps the glue at the correct working temperature all the time. There is no waste because there is no evaporation of water and glue. There are no burn-outs from evaporation of the bath because no water is used in these Electric Heaters. None of the glue is wasted because the electric dry heat principle prevents the formation of skin, scum or dirt on the glue. And less current than an electric flat iron consumes is ample to operate 13 one-quart Electric Glue Heaters. Write for Bulletin.

Aikenhead Hardware Limited

17, 19, 21 Temperance Street

Toronto, Canada



grinding machines. The catalogue is descriptive of the six by twenty inch model B machine, which has been designed to grind much of the medium sized work, which formerly has been done on larger machines.

Holcroft and Company, Detroit, Mich., have issued a catalogue on their furnaces and ovens for foundry and metallurgical work. This catalogue is descriptive of core and mold ovens for the foundry, annealing furnaces, heat-treating furnaces, and open-hearth furnaces. Small open-hearth furnaces are shown which are admirably adapted to the use of small steel foundry. Annealing and malleable iron furnaces are also treated at some length.

The Quigley Furnace Specialties Company, 29 Cortlandt St., New York City, have issued Bulletin Number 10, on their method of conveying powdered coal. Powdered coal is rapidly becoming one of the most advantageous industrial fuels and the air transport system, which has been provided for this firm, provides a sufficient means of having a central coal crushing and pulverizing plant and furnaces and other metallurgical equipment where needed.

BOOK REVIEW

Tool Making, by Edward R. Markham, the American Technical Society, Chicago. 288 pages, flexible fabrikoid binding. Many phases of the mechanical development of recent years have increased the importance of the tool maker and at the same time have resulted in the necessity for much increased knowledge on his part. To-day the tool maker represents the most skilled and inventive portion of the mechanical trades, and the contents of the book here reviewed is indicative of his various accomplishments. The tool maker and his equipment are dealt with, and the fundamental requirements for successful work and the necessary tools for accurate work are taken up. The chapter on materials and their treatment takes up the properties and uses of cast iron, wrought iron, machine steel, crucible, alloy and high speed steel, and gives instruction in the use of pyrometers and their application in the art of hardening and tempering. Other chapters take up standard tools and describe the various operations which enter into their construction. Drills, reamers, arbors, taps, thread cutting, dies, counterbores, hollow mills, forming tools, and milling cutters, are all dealt with. The setting up of various machines and the making of the various jigs, fixtures and dies necessary are an important part of modern tool room practice, and several chapters are devoted to these subjects. This book should be a welcome aid to the tool-maker, not only for its value from an educational standpoint, but also from its usefulness as a reference work in the tool-room.

INGERSOLL LOOKS AHEAD

Continued from page 222

Company are considering the advisability of putting in a box-making plant to do their own work. They require a very large amount of this kind of material, and could easily run a plant to advantage as they have the room, and some of their workmen have a good knowledge of the business.

The building to be occupied by the file works is, in all, 600 x 150 feet, making a total floor space of 90,000 square feet.

From the standpoint of the technical man, there is a lot of interesting material at the Ingersoll File Works and the John Morrow plant, and in the near future readers of CANADIAN MACHINERY will have the privilege of reading more about these places from the mechanics' viewpoint.

The T. E. Bissell Co.

Some months ago a fire occurred in Elora, the home of the T. E. Bissell Co., and seriously interfered with the working plans of the organization, so when it became possible for the company to secure premises so well adapted to their line of work it was decided to do so at once. The southern portion of the Noxon plant at Ingersoll is being overhauled to make way for the business of the Bissell Co. It is not their intention to close their Elora plant, but the increase of business makes it possible to operate both places. That is the plan for the present, at any rate, although a policy of concentrating their business may be worked out later. They also have another plant at Barker, N.Y. State, where manufacturing is being carried on for American points. Although the tariff arrangements, as they stand at present are very favorable to the Canadian plants, a change in Government might change all this, and the American plant is probably for the purpose of providing, against such a contingency.

Speaking to a representative of CANADIAN MACHINERY, Mr. Bissell, the head of the concern, stated that their only trouble now was in getting the goods fast enough. "I believe I am within the limit in stating that if I could get fifty cars of disc harrows turned out this week, we could sell them all. Our big market," he continued, "is right in this country, particularly the West. We find it difficult just now to get in touch with export business. I believe that the firms getting this business will be those who go after it with their own trained men. It is not likely to come through any Government activity."

The Bissell Co. have a display at the big tractor and accessories demonstration which is at present being held at Kansas City. The company have booked a nice lot of business for the Southern States.

The housing proposition is going to be one that will have to receive attention. Mr. Bissell stated that it was quite likely that arrangements would be made for taking advantage of the Government housing plan, and it was his opinion also that there would be improvements made

to this before very long by the Legislature. Conditions in the way of manufacturing were becoming more favorable now, although Mr. Bissell admitted that the shop in Elora was still using \$50 per ton pig iron, part of a shipment that was secured at war prices.

It is understood that Elora has not been very satisfactory as a labor market, it being hard to get men to stay in a place of that size. The plant at Ingersoll ought to be in operation in six weeks if plans now under way are not seriously interfered with.

COAL PRICES MAY NOT GO DOWN AT ALL

That is What Men Close to the Trade Say About the Situation

HAMILTON.—Coal, and the dumping of it into one's cellar, is still likely to remain an undertaking of much hazard and luck. Local coal men, in close touch with the situation, said to-day that every indication pointed to a general strike of coal miners on April 1, which, of course, meant that prices would go a-soaring again, and coal would doubtless be scarce.

City Clerk S. H. Kent, who was in Buffalo, conferring with several large coal operators, said he was informed that a strike was generally anticipated. Moreover, the mine-owners, it was stated, are determined to fight, and a strike of four or five months' duration is not deemed improbable.

Proof of the determined stand the mine-owners intend taking is found in the fact that mostly all of the coal mines have closed during the last few days and will remain closed until it is known what action the miners are likely to take.

"Men who know what they are talking about told me that coal would not be any cheaper. I would not go so far as to say that prices will be any higher than they are at present, but everyone has been hoping that with the ending of the war, coal would drop a dollar or two a ton. It is not a promising situation to my mind," said Mr. Kent.

Better working conditions and higher wages are the miners' demands.

MAY BE AT BOTTOM OF THE SCRAP MARKET

Some Cases Where An Advance in the Prices Has Been Made During the Week

SOME slight improvement is noted in the scrap metal markets. The feeling seems to be that if the prices come down any farther the yards will be sure to stock up. Any movement in this direction would be almost certain to cause an immediate stiffening of prices.

Chicago.—Cast scrap is selling fifty cents per ton better than last week. This is one of the first hopeful signs that has been seen for some time, although it is not safe to gauge the market entirely by

(Continued on page 67)

Have you ever been disappointed in your Conveyor Belts

by their opening up at the plies?

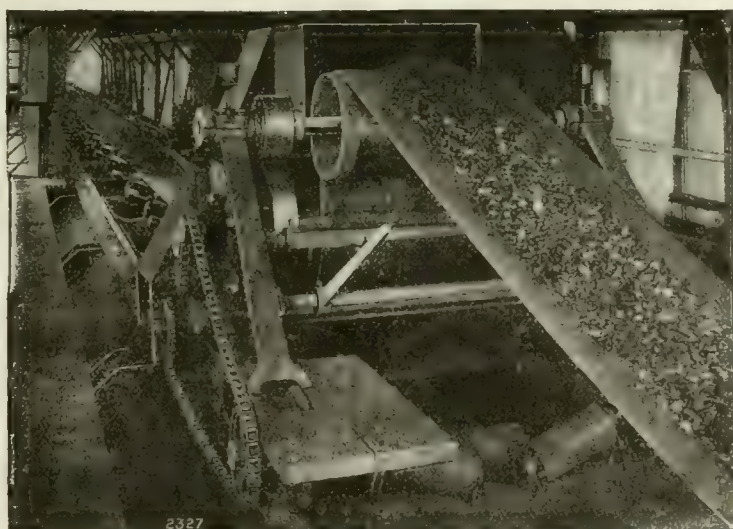
This is one of the commonest reasons for failure in a conveyor belt.

Is there a remedy? YES

Buy a belt that is not built up in plies. Such a belt is



This is a solid woven belt, made of long stock cotton, and it is built to wear. We have just had reports from two large users saying that **Scandinavia Belting** gives them more dollars in value for handling materials than any other belt that they have ever used.



Use it for conveying
CRUSHED ORE
BROKEN STONE
COAL
QUENCHED COKE
Etc.

We want your business
and solicit your inquiries.

FEDERAL ENGINEERING CO., LIMITED
172 John St., Toronto



The "Dupont" PATENT Power Hammer

The strength, durability, economy of power and simplicity of adjustment of the Dupont Power Hammer make it a decidedly superior tool.

Made carefully from carefully selected, high-class materials.

Positively
Guaranteed

Seven sizes.

With rams from 25 to 300 lbs.

Write for full details.

THE PLESSISVILLE FOUNDRY

Plessisville, Que.

Ontario and Western Agents:
The General Supply Co. of Canada, Ltd.
Ottawa Toronto Winnipeg

BOLTS

Our large stock of
Machine Bolts,
Rivets and Washers
assures quickly filled
orders and
prompt shipment.
One quality only—
The Best.
Send a trial order.

**LONDON BOLT &
HINGE WORKS**
London Ontario

WIRE SPRINGS
OF ALL
KINDS

Machine Springs, Valve Springs, Automobile
Coil Springs, etc., of a quality that defies
competition. Tell us your requirements. Send
sample or specification for price.

JAMES STEELE, LIMITED
GUELPH, ONTARIO

JOHN STIRK & SONS, Limited

HALIFAX, ENG.

MACHINE TOOLS

Agents: The A. R. Williams Mcy. Co. Ltd.
Toronto, Winnipeg, Vancouver, St. John, N.B.

GAUGES

DIES, TOOLS AND REPAIRS
OXY-ACETYLENE WELDING

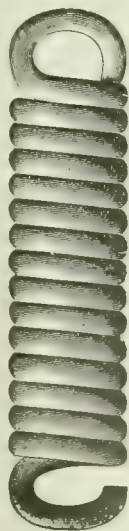
WORTH ENGINEERING CO.

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B. H. AYLSWORTH

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Oil Tempered Steel Springs

—for every purpose
and the best for each
use.

Special styles of all
kinds to order.

**THE CLEVELAND
WIRE SPRING
COMPANY**

Cleveland, Ohio
U.S.A.

METAL STAMPINGS

We are manufacturers
of stamped parts
for other manufacturers.

We do any kind of
sheet metal stamping
that you require. Our
improved presses and
plating plant enable us
to produce the finest
quality of work in a
surprisingly short time.

We can finish steel
stamping in Nickel,
Brass or Copper.

Send us a sample
order.

W. H. BANFIELD & SONS

372 Pape Avenue, Toronto, Can.

Old Man Specific

Physician Extraordinary to Nerveless,
Enfeebled Copy

By P. K. Marsh

CONTINUED FROM PAGE 2

(Do you appreciate how the "raspberry" phosphate transports the scene from the realms of fiction to that of undisputable unarguable fact?)

And that's the secret of the power of the specific in advertising, too.

It's the simple, pointed, brass tack that nails your claims, your rhapsodies and your rhythmic periods down to the solid oak foundation of facts. It's the brass tack that pierces the shell of scepticism and disbelief of Mr. Average Reader, whose motto is still "Caveat Emptor." It's the word or phrase or sentence in the ad which gives the thrill of conviction and makes the reader feel—"That man actually knows what he is talking about."

Just about now some captious reader is grinning wickedly and saying "Very pretty—very pretty—but why not be specific yourself, old top?"

Gladly, sir—for though it is far easier to find graphic examples of the specific in pure literature than in the commercial branch, still it is possible with a little diligent searching.

Instances From To-day

Do you read food advertising?

Do the vague and varied claims of delicious taste and charming flavor actually convince you, or do you discount them 25, 50 or 75 per cent. as prejudiced statements? Then read this.

"The flavors are highly concentrated. 'Half a ripe pineapple,' for instance, is used to flavor a single Jiffy Jell dessert. So these delightful dainties have a wealth of fruity taste."

The italics are mine. Note that it doesn't say "pineapple" or "ripe pineapple" or "generously flavored with pineapple." It's the specific fact "half of a" ripe pineapple that gives conviction to the claim.

Libby's mince meat does it differently.

"Tart apples—raisins from 'California'—red 'Valencia' currants—and citron from 'Greece'—snowy white suet, choice beef—candied lemon peel, oranges and spices from the 'Orient.'"

Fine—but even at that Libby slipped on the twenty-sixth and last word. Why not "Java and sunny Sumatra" or "Cey-

Continued on page 69

MAY BE AT BOTTOM OF SCRAP MARKET

Continued from page 64

it. There is a scarcity of scrap in some places, and it would not take much action to force higher prices.

New York.—Prices are better in the local market, and there is some inquiry.

Philadelphia. — Heavy melting steel has sold as low as \$14. There is not enough business moving to give a fair idea of where the market stands in any particular line.

Pittsburgh.—Heavy melting steel has been selling around \$16. A despatch to an outside paper regarding the situation here, speaking of shells, says: Heavy offerings of six inch unloaded shells are being made at \$15 and \$16 delivered Pittsburgh, thus taking the range of heavy melting steel, although rightly they should class as low phos scrap. It is stated in connection with these shells that there is only a limited demand for low phos steel scrap, and the dealers, who are the only buyers, cannot well afford to take a chance on paying any more money. Eventually they may be obliged to sell such scrap for heavy melting steel.

DEALING WITH THE RETURNED SOLDIERS

How the Canadian Vickers Has Made a Plan to Meet the Situation

What Canadian Vickers, Limited, Montreal, is doing for the returned soldiers was learned when officials of the firm were approached respecting the various rumors, discriminating against the concern, which have been in circulation. An employment bureau has been erected just outside the main gate specially for the purpose of dealing with this difficult matter, and a returned soldier is in charge, who, previous to enlistment, worked in the Vickers works as a mechanic's helper in the engine shop. A committee of returned soldiers has been elected by the returned men in the works, and this committee is in touch with the Great War Veterans' Association and with the company's officials. This committee is apparently quite in accord with what the company is doing, and in return, is anxious to do its best for the company, recognizing that it is not always possible to place an unskilled returned soldier in a vacancy for a skilled man.

The procedure followed in engaging returned soldiers is as follows: The employment bureau is opened at 6.45 a.m. and the names of the men applying for work are listed and all particulars noted of their training and fitness and their discharge certificates examined. Here again difficulties arise which call for tact both on the part of the company and the committee, due to the fact that unemployed men, who have never been in the army, obtain possession of other men's discharge certificates and present them at the bureau. This particular difficulty is practically overcome by hav-

ing a returned soldier, fully familiar with the business, in charge of the bureau. The applicant is asked if he has a "tab" from the Soldiers' Re-establishment Bureau, which bureau knows the past record of each man and what branch of work he is qualified for. If suitably experienced men are found, the particular foreman in the workshops is asked if there are any vacancies, and if there are, the returned man gets a job.

CLAIM THE WIRING WAS IN POOR SHAPE

Inquiry Into Death From Shock at The Technical School

Responsibility for the death of Morley L. Smith, chief engineer of the Central Technical School, and formerly on the editorial staff of CANADIAN MACHINERY, who was electrocuted on January 18 last, was definitely fixed on defective wiring conditions both within and without the school at the meeting of the Advisory Industrial Committee of the Board of Education. Evidence was submitted to show that if the "neutral," or third wire, to the electric transformer within the school had been grounded, the current would not have been sufficient to cause Smith's death. In consequence the committee agreed to call upon the Hydro-Electric Department for a report on the condition of the wiring at the time of the accident. The Board of Education, in the opinion of its solicitor, W.

J. McWhinney, is likely to be ordered by the Workmen's Compensation Board to compensate the widow and family of the late Mr. Smith.

The power is Hydro-Electric, and comes into the building at high voltage. It is transformed to lower voltage by a transformer in the building. According to one of the witnesses at the enquiry two weeks ago, there was a defect in the wiring inside the building, and Smith had known of that defect. Employees of the school also claimed that there was a defect in the installation of the transformer, in that the neutral wire was not grounded. Had it been it would have been impossible for Smith to receive the blow he did. Since the accident, Hydro-Electric officials had come to the school and grounded the wire.

GRAPHIC PRODUCTION CONTROL
Increases Output
Write -
Anderson's Efficiency Service
380 Queen St. West Toronto, Canada

Special Machinery MADE TO ORDER

Mill Machinery, Engine Work
Grey Iron and Brass Castings

TRY US FOR GENERAL REPAIRS

ALEXANDER FLECK, LIMITED
(Vulcan Iron Works) OTTAWA, ONT.

CASTINGS
Medium Weight Grey Iron, Brass, Etc.
JOBING
GREENLEAFS, LIMITED
Belleville, Ontario

WM. MUIR & CO., LIMITED
Manchester, England.
Machine Tool Makers.
Specialties: Patent Puncher Slotting
Machines, Milling Machines, Boring
Machines.
Agents: Messrs. Peacock Bros., 63
Bea'er Hall Hall, Montreal.
Send for catalogue.

RUBBER MILL MACHINERY
We shall be glad to hear from firms contemplating
improvements or complete installations.

BERTRAMS LIMITED
SCIENNES EDINBURGH

PLEWES Limited
WINNIPEG
For All
Machinists' Supplies

OVENS
Japanning and Varnishing Ovens
heated by Gas, Electricity,
Steam or Coal.
Kernchen Siphonage Ventilators, Bakers
Ovens, trucks, casters, etc.
Write for Booklet.
Brantford Oven & Rack Co., Ltd.
Brantford, Canada.

MAPLE LEAF
STITCHED COTTON DUCK
BELTING
DOMINION BELTING CO. LTD.
HAMILTON CANADA

"HAWK" D CHROME VANADIUM STEEL

You
Know How
Greatly it Increased
Production

You know how it proved to be without equal for both first and second operation punches—how, in both Canadian and American shell plants, this heat-treated ready-for-use steel enabled each punch to turn out over 2,000 shells.

Hawkrige Brothers' steel for every commercial requirement is just such production-increasing steel as proved this "Hawk" D. Chrome Vanadium. We make

Steel of Every
Description

Hawkrige Brothers Company

303 Congress St., BOSTON, MASS.
U. S. A.

'Barnes-Made' Springs

are unusual in
service and wear.

They are the result of sixty years' experience, unsurpassed equipment and highly skilled workmanship.

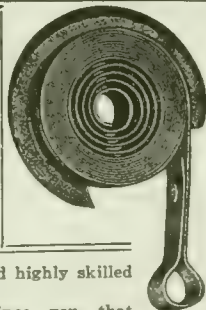
A trial will convince you that "Barnes-Made" Springs are the best buy.

Established 1857.

THE WALLACE BARNES COMPANY

218 South St., Bristol, Ct., U. S. A.

Man'frs of "Barnes-made" Products
Springs Screw Machine Products Cold Rolled Steel and Wire



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The old established firm. Patents everywhere. Head office, Royal Bank Bldg., Toronto. Ottawa office, 5 Elgin St. Offices throughout Canada. Booklet Free.

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PATENTS TRADE-MARKS AND DESIGNS

PROCURED IN ALL COUNTRIES

Special Attention given to Patent Litigation

Pamphlet sent free on application.

RIDOUT & MAYBEE, 59 Yonge Street
TORONTO, CANADA

Prompt Deliveries

on Gauges, Tools, Dies,
Jigs and Fixtures

Special Machinery

CUT GEARS

Contracting and Repairing
Machinists

Quotations cheerfully submitted.

Normac Machine Co.
55 Vine Street, St. Catharines, Ont.

MORTON MANUFACTURING CO.

PORTABLE PLANERS
DRAW CUT SHAPERS
SPECIAL DRAW CUT R.R. SHAPERS
FINISHED MACHINE KEYS
STATIONARY & PORTABLE KEY WAY CUTTERS
SPECIAL LOCOMOTIVE CYLINDER PLANERS

OFFICE --- WORKS: MUSKEGON HEIGHTS U.S.A.

STEEL PRICES ARE SHADED

New York.—Evidence continues to accumulate that steel prices are being shaded by some producers. Sale of steel bars at \$2.40, Pittsburgh, is indicated in a recent transaction. The generally quoted price on steel bars is \$2.70, Pittsburgh.

The tonnage involved in the sale at \$2.40 was relatively not large. The case, however, is merely one of many of the kind, appearing to indicate there is considerable shading of current steel quotations.

COPPER ON TOBOGGAN

A New York stock letter said: "Small sellers continue to offer copper at 15½¢ per pound, the lowest level since 1915, when the metal sold at 13¢. There is small demand. According to some authorities, investigation of conditions abroad has revealed the fact that Great Britain has on hand about 90,000,000 pounds of virgin metal, and is not expected to come into the market this year."

LUFKIN

TAPES AND RULES

The complete solution of your problem of accurate measurements. Their all-round fitness is in keeping with their accuracy.

THE LUFKIN RULE CO. OF CANADA, LTD.
WINDSOR, ONT.

PATENTS FOR SALE

Two Canadian Patented Steam Specialties for sale; one Steam Trap, Patent Number 187215, and one Steam Separator, Patent Number 183340.

Allentown Experimental Works
Allentown, Pa., U.S.A.

Old Man Specific

Continued from page 66

lon and the Dutch East Indies," or any other specific spots instead of the vague and indefinite "Orient?" Think how Masfield would have made each individual spice melt in your mouth.

During the next few months we can expect reams of white space to be employed in frantic efforts to replace war contracts in war-expanded plants. These ads will proffer vague promises of service and engineering investigation. But how many will have the tangible imagination—pricking suggestiveness of the New Jersey Zinc Company's recent ad?

"Instead of brass for a stencil—zinc. Instead of tin for the tip of a shoe lace—zinc. Instead of copper, or brass, or steel, or tin, or aluminum, zinc, for drinking cups, camera cases, alarm clocks, meters, buttons, containers for toilet preparations, pencil tops, bottle caps and hundreds of other articles."

Wouldn't that start a manufacturer to thinking far faster than any quantity of glittering generalities?

Strength, care in manufacture and purity are three qualities which are naturally emphasized in copy of practically every type. Yet in the big majority of cases the emphasis when analyzed consists largely of mere claims—rarely convincing. The individual copy writers will explain that the space assigned did not permit printing the complex facts in proof of these claims. Occasionally this is true but it is usually easily possible to inject a homely, unassuming phrase or meaty sentence to give conviction.

Velvet, for instance, gives a tangible picture of its process in few words of realistic local color.

"No way has been found that surpasses patient ageing of tobacco—in Nature's way—the way Velvet is prepared—two years in the wooden hogsheads."

Without the last few words, the first nineteen would drift vaguely and uselessly across my vision. Hogsheads—wooden hogsheads—these are two simple, believable facts quite comprehensible to my lay mind.

The scientific fact is almost always powerful and adaptable to such use. Its truth is rarely questioned, even by the inexperienced mind, simply because it is reasonably tangible, definite and exact.

"Witt's Can and Pail are made of heavy, deeply corrugated steel—galvanized and rust-proof—29 times stronger than plain steel."

Where is the selling force of those twenty-one words—in the first fifteen or in the final six? After the specific fact you are prepared to believe the later sentence—"It outlasts two ordinary cans." The specific fact has made that sentence a statement instead of a claim.

May I here hazard a guess?

The majority of readers who have followed me thus far are thinking—"It's all true but it's blatantly obvious. Why take so much time to a fundamental? A B C?"

I grant that it seems obvious—painfully obvious. But apparently it is so very obvious that it is overlooked every hour of every day by hundreds of copy writers who prepare the ads and by hundreds of executives who approve them. To secure even the half-dozen examples given here compelled me to dig through a tableful of magazines and read several hundred advertisements, which, to my mind, is a rather startling commentary on what might be termed the Invisibility of the Obvious.

The most searching ordeal for a pet bit of copy of your own conception is to read it a twelve-month later when the ardor of creation is cooled, the halo of enthusiasm dulled and only arbitrary black symbols arrayed on a white background are left to confront you. Then you are almost—but not quite—in the apathetic frame of mind of the Average Reader.

Go through your files of year-old copy. Find out for yourself that wherever old man Specific intruded into your flow of language he left a ring of sincerity and conviction glaringly absent from your pretentious ventures in "Glittering Generalities."

And some day when that copy and utterly feminine jade, "Inspiration," fails to appear to guide your halting pen, call in old man Specific. Mr. and Mrs. Average Reader will appreciate the innovation and buy your goods.

Delta Files

Are guaranteed to give more profitable results than any other files you can match against them.

Nor do we hesitate to make this seemingly over-confident guarantee.

We make it because we know DELTA FILES are the only files

And, as you may also know, but one tool steel obtainable to-day will long withstand the grinding wear to which files are subjected. That steel is **Crucible Steel**. Order from your dealer.

Made of Crucible Steel



Delta File Works

Philadelphia, Pa., U.S.A.

CANADIAN AGENTS:

H. S. Howland, Sons & Co., Toronto
Starke, Seybold, Montreal

Wm. Stairs, Son & Morrow, Halifax
Merrick-Anderson Co., Winnipeg

ALL LEADING JOBBERS

CLASSIFIED ADVERTISING

Rates (payable in advance): Two cents per word first insertion; one cent per word subsequent insertions. Count five words when box number is required. Each figure counts as one word. Minimum order \$1.00. Display rates on application.

SECTION

FOR SALE

ONE 3/16" ADT. MODEL AUTOMATIC WIRE straightener and cutting machine arranged to cut a maximum of 10 feet. E. M. Bride, 113 4th Ave. East, Calgary, Alberta. (c11m)

2 FROG AND SWITCH PLANERS. 1 RAIL and frog filler multiple spindle borer. Box 557, Canadian Machinery. (c10m)

ONE SECOND-HAND JENCKES CORLISS ENGINE—12" x 30". Cut, description and price on application to Canadian Ingersoll-Rand Co., Limited, Toronto, Ont. (ctfm)

ONE SPINDLE, GRIDLEY, AUTOMATIC, 7-inch capacity, second-hand, perfect condition, slightly used. Ontario Metal Products Company, Limited. (c15m)

MACHINERY WANTED

SIX-FOOT RADIAL DRILL FOR BOILER shop; lathe to take in 12' between centers; air hoist, 10" cylinder, 4' lift with trolley; vertical air receiver, 44" inside dia., 14' high. The National Shipbuilding Co., Ltd., Goderich, Ont.

COMPLETE WELDING OUTFIT. MUST BE IN first-class shape. Prest-O-Lite preferred. Send price and particulars to F. Clark, 95 Woodland Ave., St. Catharines. (c9m)

WANTED

WANTED—FENCE FOR INDUSTRIAL PLANT, approximately eight feet high and nine hundred yards long. Send full particulars, and where can be seen, to Box 557, Canadian Machinery. (c2m)

POSITIONS WANTED

FORGE AND DROP HAMMER SUPERINTENDENT will be open for a position shortly. Experienced in drop hammer and machinery blacksmithing, upsetting, bulldozers. Long experience in all classes of forge work. Can design dies and harden them. Box 552, Canadian Machinery. (c9m)

OFFICE POSITION, PREFERABLY PRIVATE secretary, with firm manufacturing or handling motor vehicles or machinery, by young married man, Canadian. An experienced accountant, shorthand writer and typist. Have just completed the Complete Gas Engines Course of the International Correspondence Schools. Best references. Reply P.O. Box 566, Lethbridge, Alberta. (c13m)

HELP WANTED

WANTED—A CAPABLE MACHINE TOOL salesman. State experience. Box 553, Canadian Machinery. (c14m)

MACHINE WORK WANTED

MACHINE WORK WANTED FOR LATHES, shapers, milling machine and planer, etc. Hourly or contract basis. Prompt delivery. W. H. Sumbling Machinery Co., Toronto. (ctfm)

PATTERNS

TORONTO PATTERN WORKS, 65 JARVIS Street, Toronto. Patterns in wood and metal for all kinds of machinery. (cfm)

BRANTFORD PATTERN WORKS ARE PREPARED to make up patterns of any kind—including marine works—to sketches, blue prints or sample castings. Prompt, efficient service. Bell Phone 631; Machine Phone 733. Brantford Pattern Works, 49 George St., Brantford, Ont. (ctfm)

FOR SALE

Two 3 x 36" geared feed Turret Chucking machines with 3" collet chucks, about 3½ years old. Price, each \$700.00.

Three 3 x 36" Friction Feed Chucking machines without Collet Chucks, complete with Friction Counter Shafts, about 6 or 7 years old. Price, each \$300.00.

The above are Jones & Lamson make.

Three 8 x 8" Open Type Single Horizontal Belt Driven Air Compressors, with unloaders. Capacity 75 cubic feet air per minute. Each \$400.00. Extra for Air Tanks if required.

One No. 2A Warner & Swasey Collet Chucking Machine, complete with Oil Pan, Cross Feed and Counter Shaft. Price, \$750.00.

One 2½" Engine Lathe x 10', Flathead. Price, \$350.00.

DARLING BROTHERS, LIMITED
Engineers, Manufacturers and Founders
120 Prince Street, Montreal, P.Q.
(ctfm)

Wanted immediately, Heavy Duty Lathe, new or used, good condition, ranging from 40" to 18". Swing, about 25 ft. between centers. Arranged for Motor Drive.

CANADA FORGE CO.'S PLANT,
Welland, Ont. (ctfm)

MACHINERY

NEW AND SLIGHTLY USED

14—16" x 6' South Bend double back geared lathes.
5—16" x 6' South Bend single back geared lathes.
1—10" x 36" Norton grinder.
1—No. 2 Ford-Smith plain miller.
1—16" x 22" x 8' Sebastian gap lathe.
50 and 75 H.P. Motors.
1—340 cubic ft. Rand Compressor, Aftercooler and Receiver, belt, and 5" pipe.
New Transmission material of all kinds.
12—Racine hack saws.

Cuts, detailed descriptions and prices on application.

ELGIN MANUFACTURING CO., LTD.,
St. Thomas, Ont. (c11m)

WANTED TO PURCHASE

SECOND HAND GAP LATHE, in good condition 72 inch face plate, with tail stock, and motor (two tests). Give name of maker and all particulars. Swedish Steel & Imp. Co., Ltd., 50 Canadian Express Building, Montreal, Que. (c9m)

USED

MACHINERY

In stock at New Glasgow and offered for sale:

1 "Bullard" lathe 20x12'-0"
1 "Curtis" air hoist 8"x4'-0"
1 "Matheson" hydraulic press 14"x24"
1 "Sturtevant" volume blower, No. 7
1 "Grant" riveting hammer, belt driven (NEW)
1 "Berlin" hardwood flooring planer and matcher, No. 88.

Write for particulars and prices.

I. MATHESON & CO., LTD.
Builders of Machinery
New Glasgow, Nova Scotia
tf

FOR SALE

In first-class condition, Canadian Ingersoll-Rand
AIR COMPRESSOR

Belt driven, 14" by 9" by 12", with automatic unloader. Capacity 470 cu. ft. per min. Vertical Air Receiver, 42" by 10 ft. 75 H.P. Crocker-Wheeler Induction Motor, 550 volt, 25 cycle, 750 r.p.m.

P. W. Ellis & Co., Ltd.

St. Clair Works:

St. Clair Ave. and Prescott St., Toronto

IMMEDIATE SHIPMENT

LATHES.

12" x 5' LEBLOND, standard.
 14" x 6' McKENZIE, standard.
 14" x 8' LEBLOND Toolroom Equipment.
 14" x 7' HENDEY Toolroom Equipment.
 6—16" x 6' C.M.C. double back gear, quick change gear.
 18" x 6' CISCO, double back gear.
 19" x 10' LEBLOND heavy duty.
 22" x 10' REED PRENTICE, geared head.
 12—26" x 12' C.M.C. double back gear, quick change.
 28" x 10' CONRADSON geared head.
 36" x 14' NEW HAVEN triple geared.
 24"—40" x 20' McCABE, double spindle.
 28"—44" x 14' BERTRAM gap lathe.
 20" x 36" x 14' CMC gap lathe, double back gear, quick change gear.

SHAPERS.

15" McKENZIE B.G. crank.
 16" RAE B.G. crank.
 16" STEPTOE crank.
 20" GOULD & EBERHARDT high duty.
 24" and 28" GOULD & EBERHARDT high duty.

MILLERS.

No. 1½ and 2½ LEBLOND Universal.
 No. 3H and 4 LEBLOND Universal.
 No. 3 FORD-SMITH Universal.
 BECKER vertical single pulley drive.
 BECKER No. 7HS Lincoln type.
 No. 1½ AMERICAN plain.

GRINDERS.

No. 3 LANDIS Universal.
 No. 1 LEBLOND Universal Tool.
 No. 2 OAKLEY Universal Tool, power feed and wet attachment.

The above list merely gives part of our stock, which is ready for immediate shipment from Toronto.

Write our Service Department and put your proposition up to them.

THE A. R. WILLIAMS MACHINERY CO., LIMITED
 64 FRONT ST. W. TORONTO

GISHOLT Tool Grinder.
 BAY STATE vertical surface.

DRILLS.

10" MYERS bench sensitive.
 10" McKENZIE sensitive.
 14" MYERS column sensitive.
 14" PERFECT column sensitive.
 15" BARNES lever feed.
 20" BARNES back geared.
 22" BARNES sliding head.
 26", 28" and 34" BARNES sliding head.
 26" and 28" BARNES with taper.

RADIALS.

2" FOSDICK National pattern.
 3" NILES box table.
 4" CINCINNATI-BICKFORD, speed box drive.
 5" BICKFORD variable speed motor drive.
 5" LONDON box table.
 5" FOSDICK heavy duty speed box and tapping attachment (new).

PLANERS

24" x 24" x 7' LONDON heavy pattern.
 30" x 30" x 8' BERTRAM, one head.
 36" x 36" x 12' BERTRAM, one head.
 42" x 42" x 10' MCGREGOR GOURLAY, heavy pattern, 2 heads.

MISCELLANEOUS.

No. 2 BAKER Keyseating machine.
 No. 2 MITTS & MERRILL Keyseating machine.
 8" JARECKI pipe threading machine.
 4" MERRILL pipe threading machine.
 1½" WELLS bolt cutter.

IN THE Financial Post THIS WEEK

IMPLEMENTS FOR IRELAND

REPRESENTATIVES of the Irish Co-operative Agricultural Society, now in Ottawa, have concluded arrangements for the purchase of a large quantity of agricultural machinery. The order was placed with the Frost & Wood Co. of Smiths Falls, Ontario, and will be put in hand at once. It is learned that other orders from the Co-operative Society—orders of considerable magnitude will follow very shortly.

Francis H. Whitton of the Steel Co. of Canada on Keeping the Wheels Turning

"There may be justification for criticism in regard to dissatisfaction and strikes in time of plenty, but when it comes down to trade conditions as at the present time, caused by no fault of either the employer or employed, it is time for a consultation to diagnose the situation seriously and call on every source of possible assistance to provide a remedy and no one can escape the personal responsibility to play his part to the full. Our fighting men have proved their metal, our generals have led their forces to a successful issue and I see if our Canadian citizens will do their part in the same spirit through the whole ranks of manufacturers, consumers and distributors of Canadian products, the industrial forces, both employers and workmen, will put forth efforts that will result in Canadian commerce taking on life to a degree that will provide employment and build up business prosperity and confidence."

Besides the important article from which the above quotation is made, THE POST this week deals with the following amongst

OTHER SUBJECTS OF INTEREST

No Longer Need Bonus for Mining Gold
 Big Increase for Canadian Manufacturers
 Mining Engineers of Two Countries Want More Unity
 Uncertainties Ahead for Steel Industry
 Four Per Cent. Dividend for Laurentide Power
 Woods Manufacturing Co. Did Business of \$12,000,000
 Holding Company Again Mooted for Laurentide
 Shawinigan Co. Shows 28 Per Cent. Gain in 1918 Output
 Good Results for Maritime Province Cos.
 Western Cities Continue to Show a Falling Off
 Dominion Life Finished 1918 in Strong Position
 Disgruntled are the Poor Risks With Banks
 Standard Bank Profits Reach New High Level
 Business Men Still Needed
 The Danger of Thinking in Millions
 Bond Market Continues on Quiet Side
 Seven Houses Underwrite New Tram Power Issue
 Dominion Power Showed Record Gross Earnings
 Cement Earnings Likely to be Less
 1917 Eclipsed Former Years for Minerals
 Sovereign Life Weathers Trying Period
 Montreal Loan Made 14.3 Per Cent. Net on Capital
 Main Principles for Solution of U.S. Rail Problem

Fill in this Form and keep in Touch with Canadian Affairs.

The MacLean Publishing Co.,
 143-153 University Ave., Toronto.

Send me THE FINANCIAL POST every week till further ordered. I will pay subscription price, \$3.00 per year, on receipt of bill or you may draw on me for this.

Name

Address

"One insertion of this ad will do"

We receive from three to four ads a month from the firm who told us this when sending in their last ad. So you see they **know** what the Classified Advertising Section can do for them.

There is no reason why it won't do the same for you if your proposition is of interest to our readers.

Canadian Machinery
 Classified Advertising Section
 143 University Avenue, Toronto, Ont.



In Stock for Immediate Delivery

Turbo-Generator Units	Boilers
Direct Connected Units	Smoke Stacks
Motor Generators	Tanks
Rotary Converters	Condensers
Transformers	Air Compressors

Separate Published Stock Lists for above apparatus.
Staff of Engineering Specialists with three overhauling
plants to SOLVE YOUR POWER PROBLEMS.

Buyers and Sellers of New and Used
Machinery

Send us details of used plant for sale

MacGovern & Company, Inc.

285 Beaver Hall Hill - - - Montreal

Offices: New York, Pittsburg, St. Louis.

Plants: Brooklyn, N.Y.; Lincoln, N.J., and Linden, N.J.

A Continent-Wide Service.

IMMEDIATE DELIVERY MONTREAL STOCK

Motors 3-Phase 60-Cycle

75	H.P., 550	VOLTS,	450 R.P.M.	2
60	H.P., 550	VOLTS,	450 R.P.M.	1
5	H.P., 550	VOLTS,	1,150 R.P.M.	1
3	H.P., 550	VOLTS,	1,200 R.P.M.	1
2	H.P., 550	VOLTS,	1,200 R.P.M.	1

TRANSFORMERS...3

200 K.V.A., 2200 2300 14000 15000, 60 Cycles.

TRANSFORMERS, POLE TYPE 550 $\frac{220}{110}$ VOLTS

5 K.W. 2 10 K.W. 1

D.C. LIGHTING GENERATOR

10 K.W., 110 VOLTS, 450 R.P.M. 1

RAND AIR COMPRESSOR, 800 F T. 1

Prompt Delivery and Subject to Inspection.

Low Phosphorus Pig Iron, Electric Furnace
Products, Steel Products of all descriptions.

Zenith Coal & Steel Products, Limited
402 McGill Building Montreal

Below is a list of valves and fittings used in connection with pumps, accumulators and shell presses, all of which are in first-class working order:

The following suitable for 1,500 lbs. working hydraulic pressure:—

- 3—4" flanged, By-pass Valves, steel body (R.D. wood).
- 7—3" flanged, By-pass Valves, steel body (R.D. wood).
- 5—3½" flanged, By-pass Valves, steel body (Dean and Steam Pump Co.).
- 3—3" screwed ends, By-pass Valves, brass body (R.D. wood).
- 7—3½" flanged ends, Shock Relief Valves, steel body (R.D. wood).
- 5—3½" screwed ends, Check Valves, steel body (R.D. wood).
- 8—3" screwed ends, Check Valves, steel body (R.D. wood).
- 4—4" flanged ends, Check Valves, steel body (R.D. wood).
- 3—3" screwed ends, Check Valves, brass body (R.D. wood).
- 12—4" flanged ends, Balance Stop Valves, steel body (R.D. wood).
- 2—6" flanged ends, Balance Stop Valves, steel body (R.D. wood).
- 6—3½" flanged ends, Balance Stop Valves, steel body (R.D. wood).
- 20—3" screwed ends, Balance Stop Valves, brass body (R.D. wood).
- 2—3½" screwed ends, Balance Stop Valves, brass body (R.D. wood).
- 5—2" screwed ends, Balance Stop Valves, brass body (R.D. wood).

- 1—6" flanged ends, Balance Stop Valves, steel body. NEW (R.D. wood).

The following suitable for 250 lbs. working water pressure:—

- 6—4" Pratt & Cady, screwed ends, Horizontal Flapper Check Valves, iron body.
- 2—4" Pratt & Cady, flanged ends, Horizontal Flapper Check Valves, iron body.
- 3—5" Jenkins, flanged ends, inside screw, Gate Valves, iron body.
- 3—4" Jenkins, flanged ends, inside screw, Gate Valves, iron body.
- 2—5" Crane Co., flanged ends, inside screw, Gate Valves, iron body.
- 4—4" Crane Co., flanged ends, inside screw, Gate Valves, iron body.
- 7—3½" Crane Co., flanged ends, inside screw, Gate Valves, iron body.
- 3—3½" Jenkins, flanged ends, inside screw, Gate Valves, iron body.

The following suitable for 125 lbs. working water pressure:—

- 6—5" Pratt & Cady, screwed ends, inside screw Gate Valve, iron body.
- 1—5" Pratt & Cady, flanged ends, inside screw, Gate Valve, iron body.
- 2—5" Jenkins, screwed ends, outside screw, Gate Valves, iron body.
- 5—4" Crane Co., screwed ends, outside screw, Globe Valves, iron body.
- 8—4" Kennedy, screwed ends, inside screw, Gate Valve, iron body.

Cast Iron, Cast Steel and Steel Forging Elbows, Tees and Flanges, suitable for water pressures 125, 250 and 1,500 lbs.

Canada Foundries and Forgings, Limited (Canada Forge Plant)
WELLAND, ONTARIO

MACHINE TOOLS FOR SALE

The equipment listed below contains several items that are new. All are available for immediate delivery.

LATHES

- 1 New Sidney Lathe—Double back gears; quick change gears; max. distance between centers 11'; max. swing over shears 27½"; taper attachment.
- 2 Hamilton, O., Lathes—Swing over shears, 20" and 21"; max. distance between centers 4' 4"; opened gears; double back gears; one has Independent chuck and one has one Independent and one Universal chuck; good condition.
- 1 Sebastian Lathe—Swing over shears, 15"; max. distance between centers, 5' 6"; opened gear; single back gear; one Universal chuck; fair condition.
- 1 Sebastian Lathe—Swing over shears, 15"; gap 2"; max. distance between centers, 3'; opened gear; single back gear; one Universal chuck; fair condition.
- 1 LeBlonde, H.D. Lathe—Swing over shears, 26"; max. distance between centers, 11'; opened gear; single back gear; fair condition.
- 1 C.M.C. Lathe—Swing over shears, 20"; max. distance between centers, 9' 6"; taper turning attachment; quick change gear; double back gear; one Independent chuck; good condition.
- 1 C.M.C. Lathe—Swing over shears, 18"; max. distance between centers, 3' 6"; taper turning attachment; double back gear; good condition.
- 4 C.M.C., H.D. Lathes—Swing over shears, 26"; max. distance between centers, 6'; two with and two without taper turning attachment; quick change gears; three with Independent chuck and one with Universal chuck. These lathes are new.
- 1 Gleason Lathe—Swing over shears, 24"; max. distance between centers, 3'; open geared; single back gear; fair condition.

POWER SAWS

- 5—Atkins power saws, each 14" capacity; complete with pumps; fair condition.

DRILL PRESSES (Vertical)

- 1—Barnes, 18"; fair condition.
- 1—Bertram, 42"; fair condition. Adjustable table and vertical movement on drill carriage.

PLANER

- 1—London, 36" x 36" x 7' 6", table; good condition.

TURRET BORING MILL

- 1—Bertram, 34"; turret with five bars; 17" between table and cross rail; new.

- 1 Cisco Lathe—Swing over shears, 15"; max. distance between centers, 3'; quick change gear; single back gear; one Universal chuck; fair condition.

- 1 Barnes Lathe—Swing over shears, 18"; max. distance between centers, 5'; eight feed changes in apron of carriage; single back gear; one Universal chuck; good condition.

- 1 Hepburn Lathe—Swing over shears, 20"; max. distance between centers, 26"; good condition.

- 1 Bertram Lathe—Swing over shears, 26"; max. distance between centers, 8'; taper turning attachment; quick change gears; double back gears; one Independent chuck; good condition.

- 1 Pond Lathe—Swing over shears, 38"; max. distance between centers, 9'; taper turning attachment; quick change gears; triple back gears; good condition.

- 1 LeBlonde H.D. Lathe—Swing over shears, 30"; max. distance between centers, 16'; quick change gears; double back gears; good condition.

- 1 LeBlonde H.D. Lathe—Swing over shears, 26"; max. distance between centers, 12'; quick change gears; double back gears; good condition.

- 1 LeBlonde H.D. Lathe—Swing over shears, 26"; max. distance between centers, 4'; taper turning attachment; quick change gears; double back gears; one Universal and one Independent chuck; very good condition.

- 1 LeBlonde H.D. Lathe—Swing over shears, 20"; max. distance between centers, 3'; taper turning attachment; quick change gears; double back gears; one Universal chuck; very good condition.

- 1 Hepburn Lathe—Swing over shears, 20"; 3' between chuck and carriage; one set drawn in collar near chuck; good condition.

COLD SAWS

- 6 Newton cold saws; capacity 7½" for rounds; 7" for squares. Direct or line shaft drive.

CUT-OFF MACHINE

- 1 Hall, suitable for stock 4" to 6½"; fair condition.

MOTORS

- 5—10 H.P. motors, 25 cycle, 3 phase, 220 volt, 750 r.p.m.
- 5—125 H.P. motors, 25 cycle, 3 phase, 220 volt, 750 r.p.m.
- 4—250 H.P. motors, 25 cycle, 3 phase, 2,200 volt, 730 r.p.m.

GRINDER CYLINDRICAL

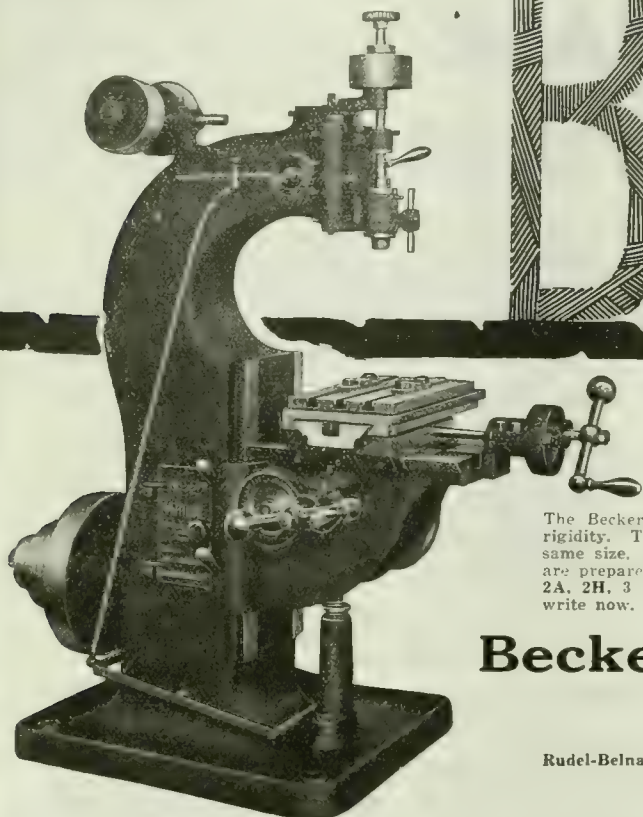
- 1—Ford-Smith, swing 16"; centre of wheel to center of tail-stock at max. pt. 27"; max. distance between centers, 3' 6"; actual length of bed, 6"; fair condition.

For Further Particulars Apply to

Canada Forge Plant
Canada Foundries and Forgings, Limited
WELLAND, ONT.

Becker Belt-Driven Millers
—The Machines that Give the
Smooth Finish

BECKER



**Why You Should Select
This Milling Machine**

The Becker Miller has many exclusive features which give it matchless speed and rigidity. Then it requires one-third to one-half less power than other millers of the same size. QUICK DELIVERIES—another feature of Becker Machines; in fact we are prepared to ship upon receipt of your order any of the following sizes: No. 1, 2, 2A, 2H, 3 and 4B. Any information you may require will be gladly furnished—write now.

Becker Milling Machine Co.
Hyde Park, Boston, Mass.

Canadian Agents:

Rudel-Belnap Machinery Company, Ltd., 137 McGill St., Montreal; A. R. Williams Machinery Company, Ltd., 64 Front St. West, Toronto.

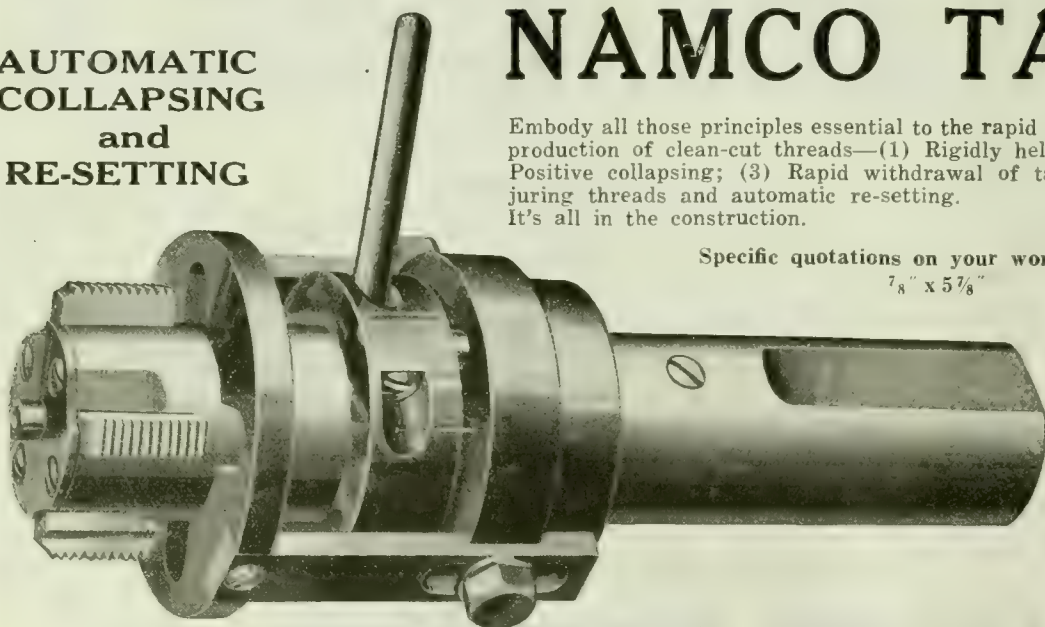
**AUTOMATIC
COLLAPSING
and
RE-SETTING**

NAMCO TAPS

Embody all those principles essential to the rapid and economical production of clean-cut threads—(1) Rigidly held chasers; (2) Positive collapsing; (3) Rapid withdrawal of tap without injuring threads and automatic re-setting. It's all in the construction.

Specific quotations on your work. Capacities,

$7/8" \times 5 7/8"$



THE NATIONAL ACME COMPANY

NEW ENGLAND PLANT,
WINDSOR, VERMONT

CLEVELAND, OHIO, U.S.A.

CANADIAN PLANT,
MONTREAL, P.Q.

Branch Offices: NEW YORK, BOSTON, CHICAGO, DETROIT, ATLANTA, SAN FRANCISCO
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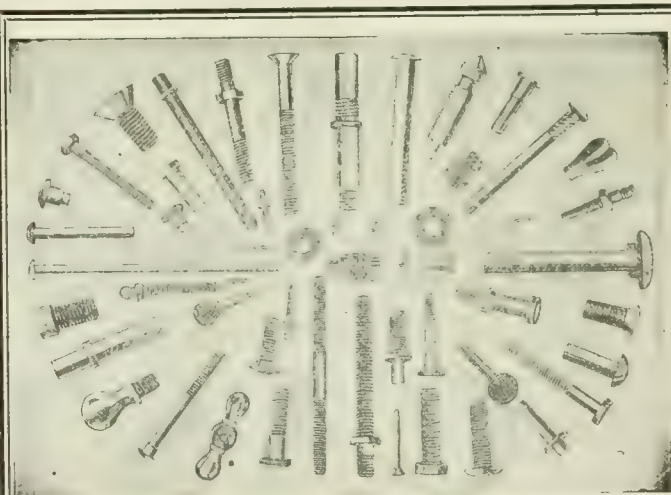
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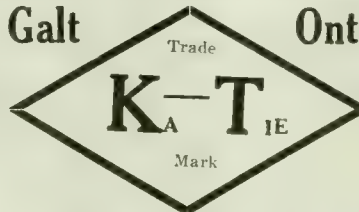
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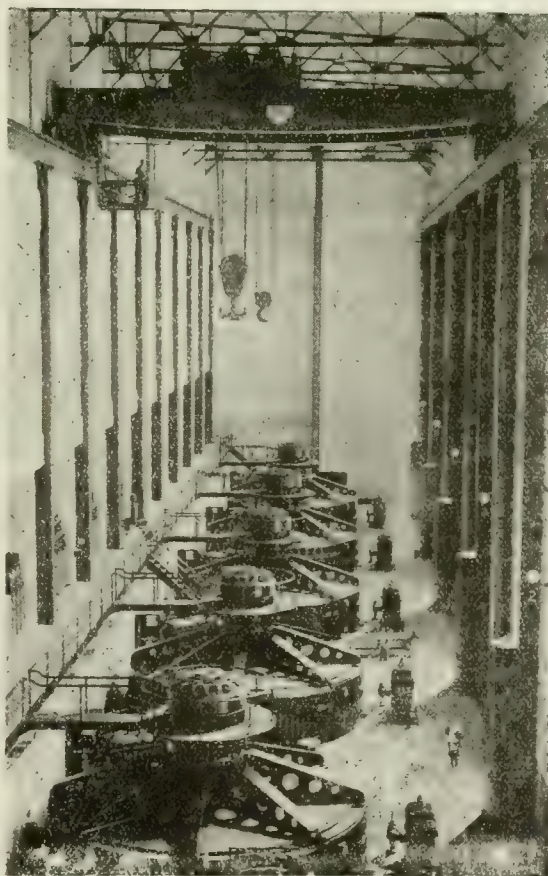
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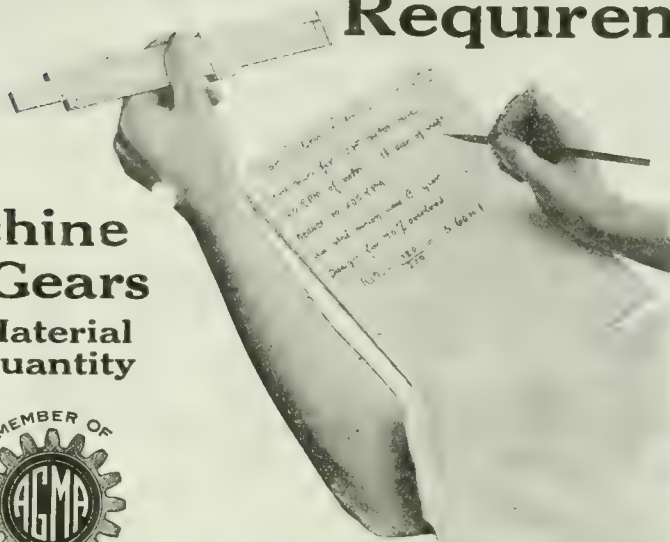
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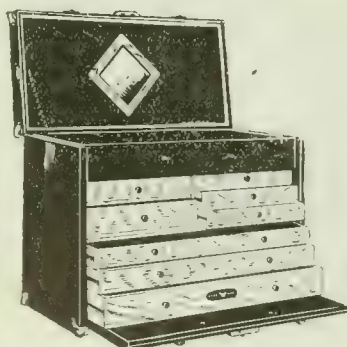
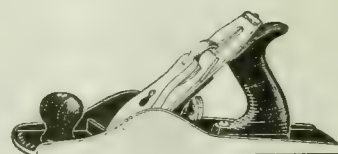
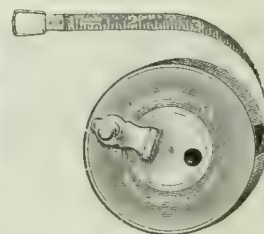
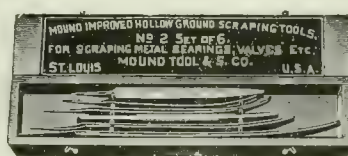
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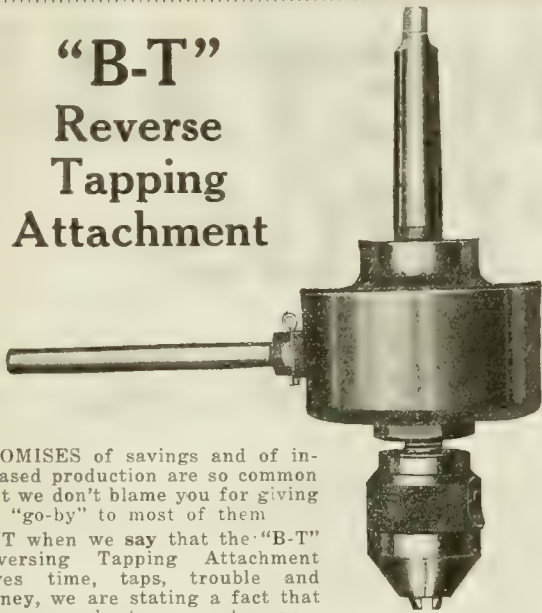
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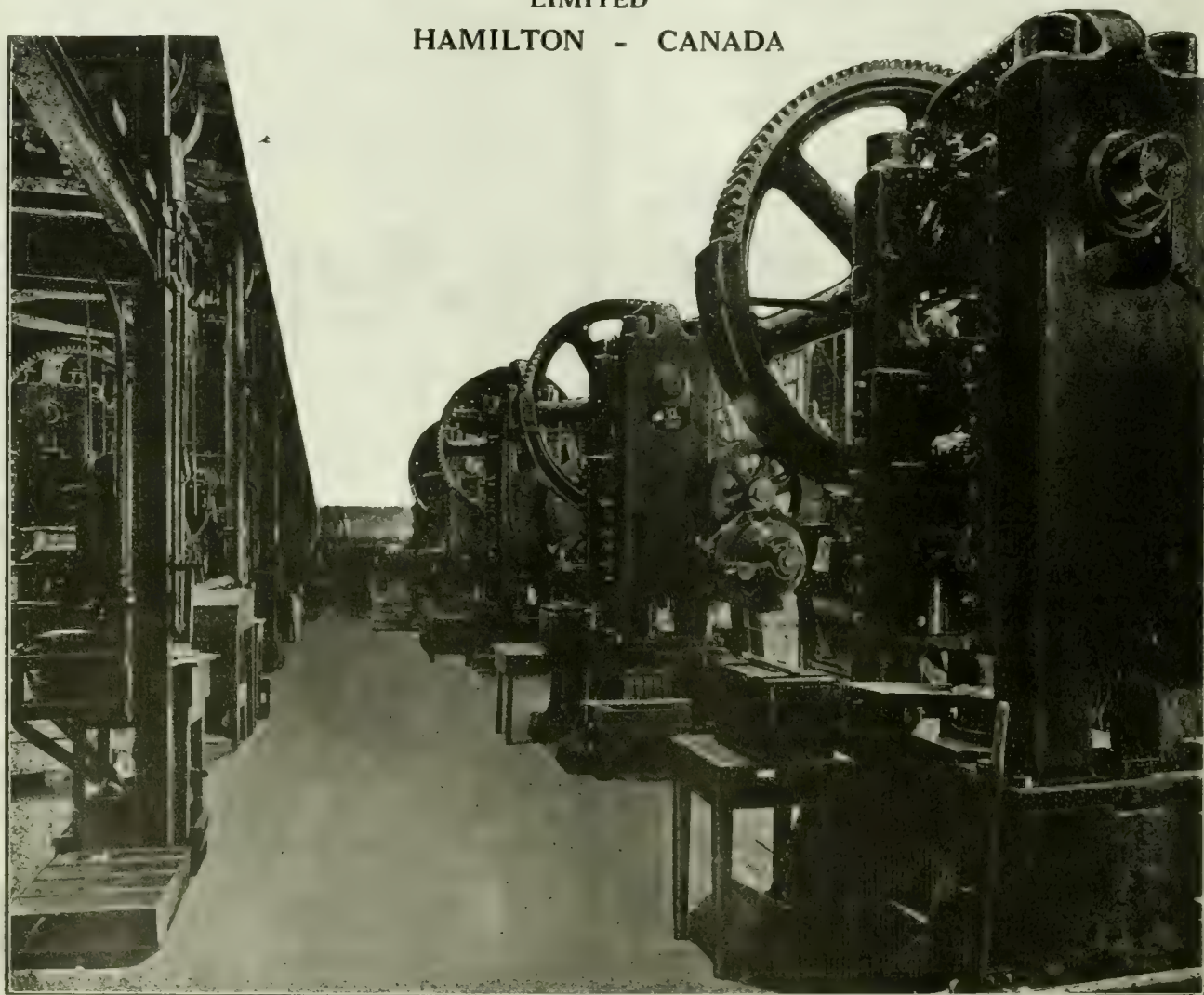
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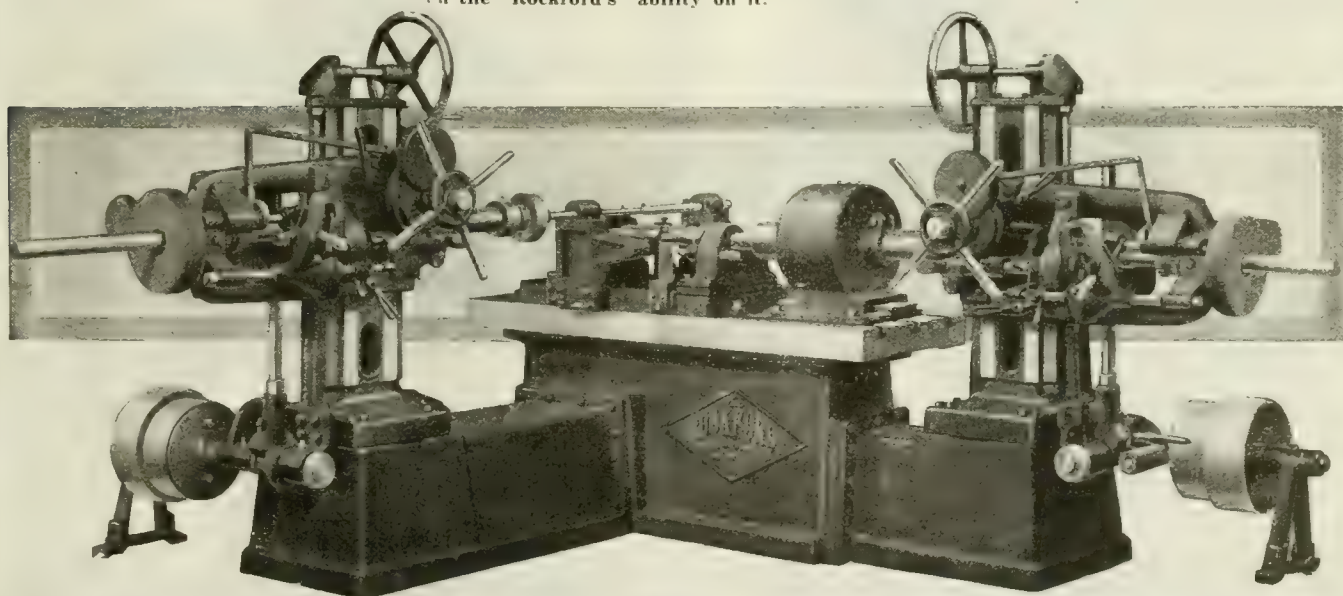
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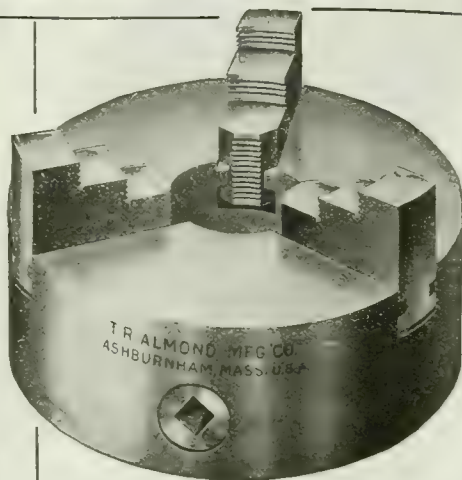
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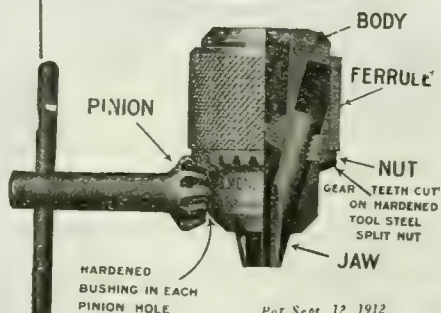
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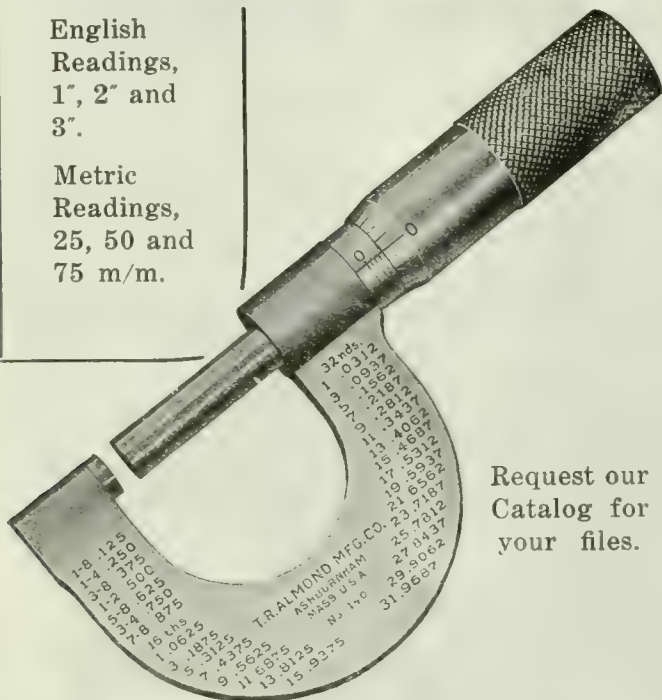
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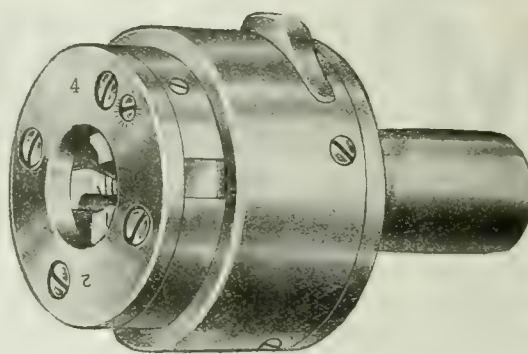
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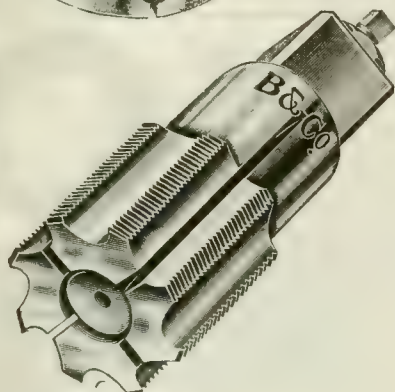
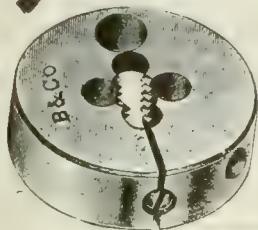
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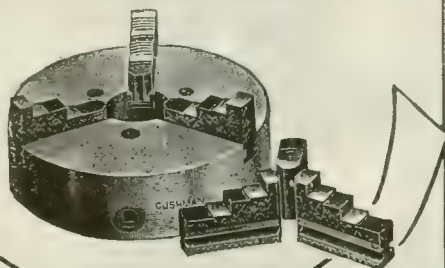
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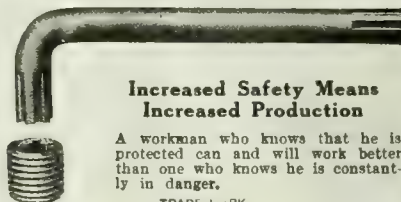
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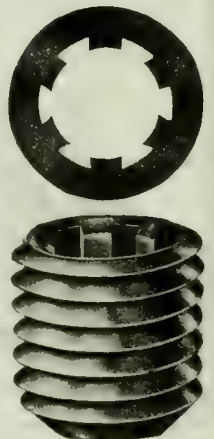
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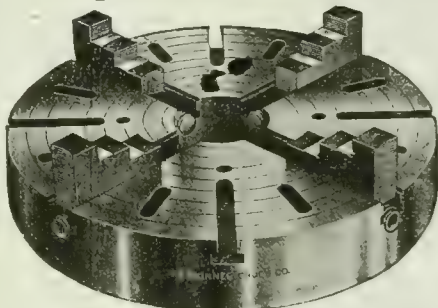
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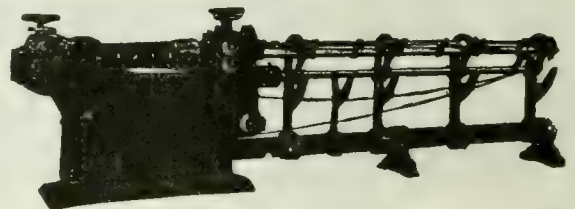


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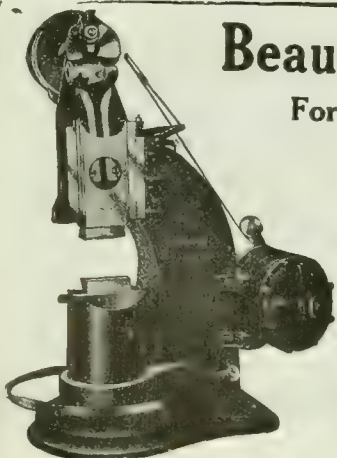
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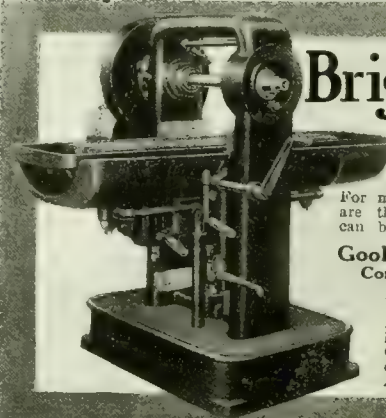
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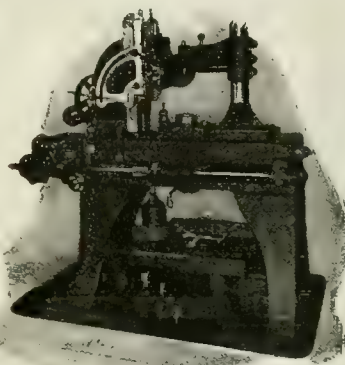
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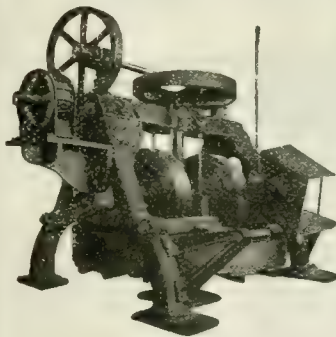
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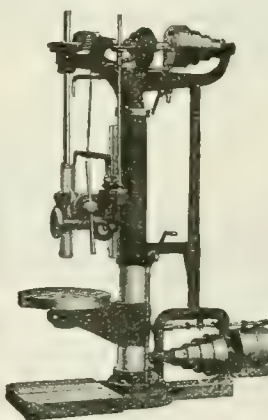
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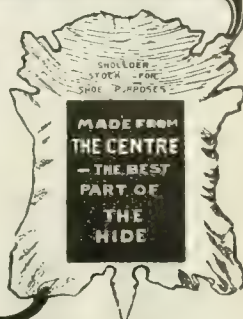
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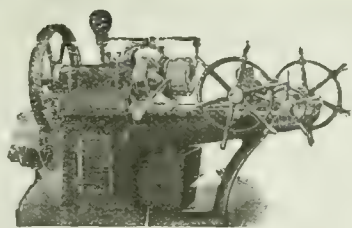
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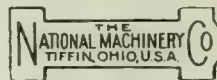
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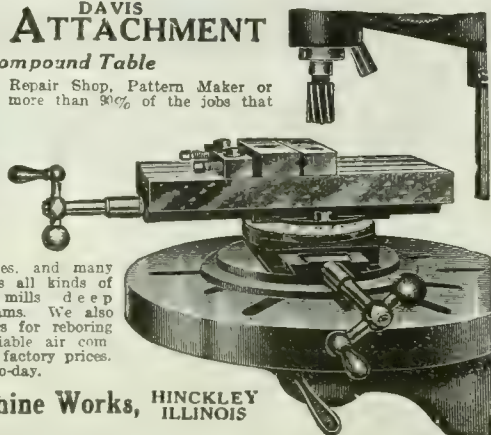
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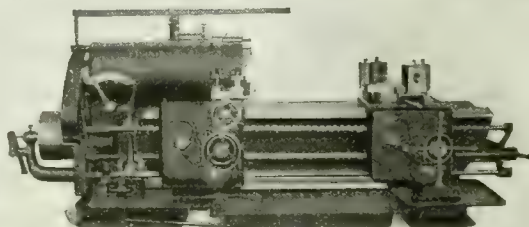
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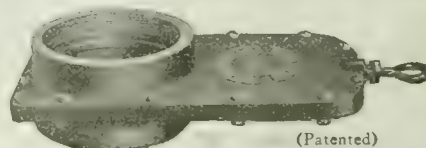


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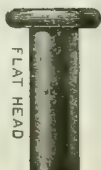
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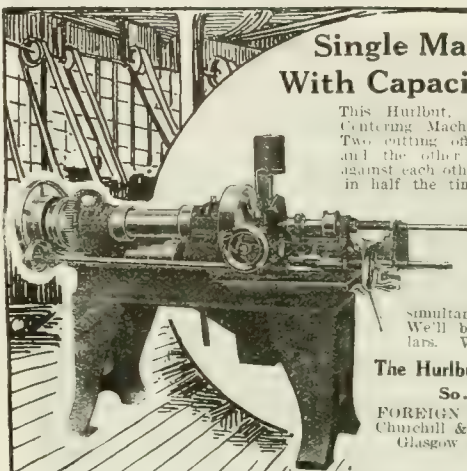
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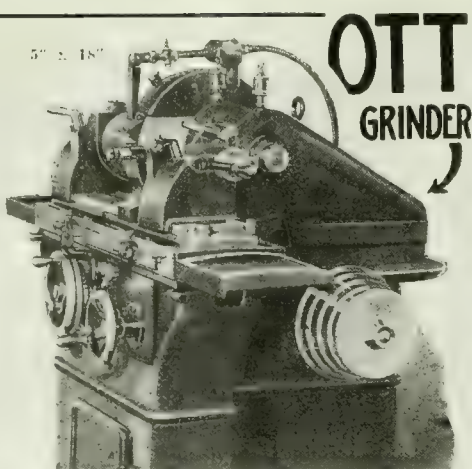
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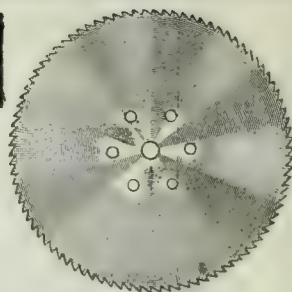
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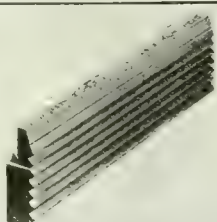


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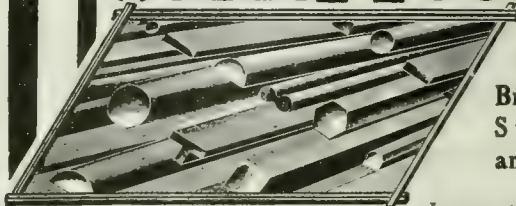
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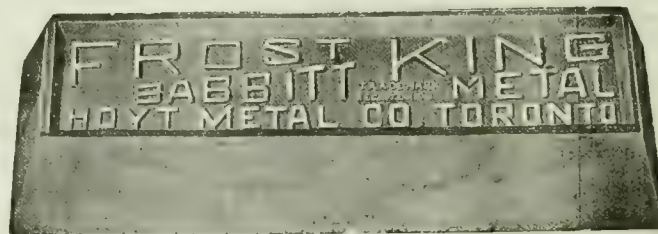
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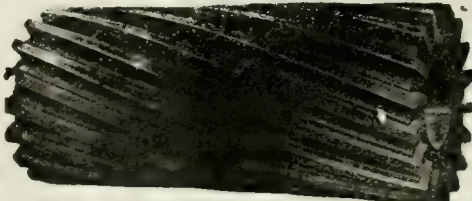
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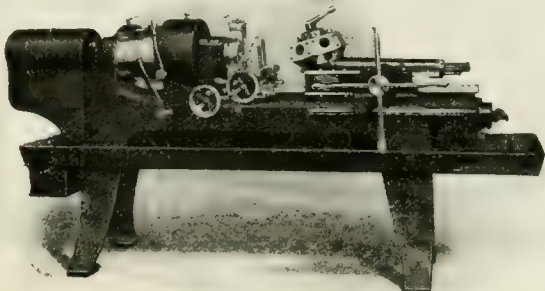
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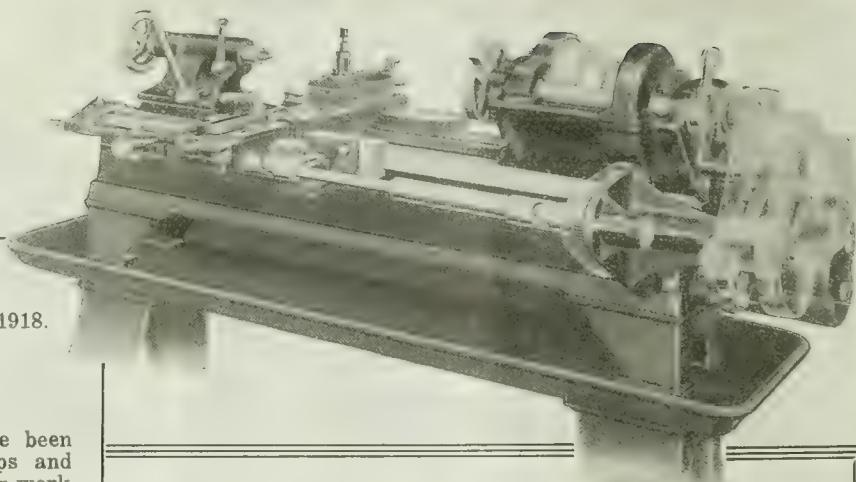
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With best wishes, we are,
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"The Mysterious German Onions"

On nights when the German air raiders were out, they sent up strange, luminous balls behind their lines and anchored them above the clouds—globes of fire which could be seen for forty miles or more. What these "onions" were, or how they were kept in stationary position above the clouds, is still a profound mystery. The Allies never learned anything about them, but the Allied night bombing crews steered their course to the Rhineland by the luminous buoys thus provided.

What is known about the onions is told by Lieut. J. Vernon McKenzie in the course of an article, "Raiding the Rhineland," in MARCH MACLEAN'S. It is an intensely interesting article, telling all about the great reprisal campaign which implanted the fear of war in the German civilian heart.

"NO HOPE FOR THE WETS"

"Already the temperance forces are lined up to stop any possible break in the prohibition dam," writes J. K. Munro, in discussing what is going to happen at the coming session at Ottawa. He predicts that Union Government will hold together, but that the habit it has contracted of promising everything asked is going to make a lively session. He expects:

Dry legislation at the earliest possible moment.
The moral reform forces in control.
No change in the Divorce Law.
Tariff concessions made to the West.

*The March number, in fact, is full of live, up-to-the-minute features.
The famous Canadian Ace, Lieut.-Colonel W. A. Bishop is on the cover.*

Some of the outstanding articles and stories are:

The Transformation (a new serial)—By Frederic S. Isham.

A Canadian King-maker (the story of Lord Beaverbrook in Britain)—By Maurice Woods.

Fitting in the Returned Soldier—By George Pearson.

The Three Sapphires—By W. A. Fraser.

The Strange Adventure of the Nile Green Roadster—By Arthur Stringer.

Fakers—and Others—By E. Ward Smith.

Lend Me Your Title—By Onoto Watanna.

A Shady Deal—By Archie P. McKishnie.

The City of Lost Laughter—By Mary Josephine Benson.

The Voice of Canada Interpreted

A new department starts in this number given over to summarizing and presenting opinion in Canada on outstanding topics, as reflected in the press. In this issue the department is given over to a careful compilation of opinion on the problems of the returned soldier.

Events of the World in the Remaking

Germany Ready for Trade War
Three-Year Marriages in France
No Solution in Ireland Possible?
Controlling Booze in Britain
Is Czar Still Alive?

Did Dr. Diesel Die?
The Secret British Ferry
The Poison That Didn't
The Problem
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Rickert-Shafer Co., Erie, Pa.
Standard Machy. & Supplies, Ltd., Montreal.
Stoll Co., Inc., D. H., Buffalo, N.Y.
Wells Brothers of Canada, Galt, Ont.
Williams & Wilson, Limited, Montreal, Que.

Greenfield Tap & Die Corp., Greenfield, Mass.

Wells Bros. of Can., Galt, Ont.

Williams & Wilson, Limited, Montreal, Que.

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Pittsburgh Steel Stamp Co., Pittsburgh, Pa.

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A. B. Jardine & Co., Ltd., Hespeler, Ont.

Wells Brothers Co. of Canada, Galt, Ont.

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Bandfield, W. H., & Son, Toronto.
Boker & Co., Inc., H., Montreal, Que.
Butterfield & Co., Rock Island, Que.
Brown, Boggs & Co., Hamilton, Ont.
Canadian Fairbanks-Morse Co., Montreal.
The Geo. F. Foss Mch. & Supply Co., Montreal.
Gardner, Robt., & Son, Montreal.
A. B. Jardine & Co., Hespeler, Ont.
Landis Machine Co., Waynesboro, Pa.
Modern Tool Co., Erie, Pa.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
National Acme Co., Cleveland, Ohio.
Pratt & Whitney Co., Dundas, Ont.
Rice, Lewis & Son, Toronto, Ont.
Rickert-Shafer Co., Erie, Pa.
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Stoll Co., Inc., D. H., Buffalo, N.Y.
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National Acme Co., Cleveland, Ohio.
Pratt & Whitney Co., Dundas, Ont.
Rice, Lewis & Son, Toronto, Ont.
Rickert-Shafer Co., Erie, Pa.
Standard Machy. & Supplies, Ltd., Montreal.
Stoll Co., Inc., D. H., Buffalo, N.Y.
Wells Brothers of Canada, Galt, Ont.
Williams & Wilson, Limited, Montreal, Que.

Greenfield Tap & Die Corp., Greenfield, Mass.

Wells Bros. of Can., Galt, Ont.

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Wells Bros. of Can., Galt, Ont.

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Firth & Sons, Thos., Montreal, Que.
Landis Machine Co., Waynesboro, Pa.
Wells Brothers Co. of Canada, Galt, Ont.

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Modern Tool Co., Erie, Pa.
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Windsor Mech. & Tool Co., Windsor, Ont.
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Murchey Machine & Tool Co., Detroit, Mich.
National Acme Co., Cleveland, Ohio.
Pratt & Whitney Co., Dundas, Ont.
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Garlock-Walker Machinery Co., Toronto, Ont.
Garvin Machine Co., New York.
A. B. Jardine & Co., Ltd., Hespeler, Ont.
Niles-Bement-Pond Co., New York.
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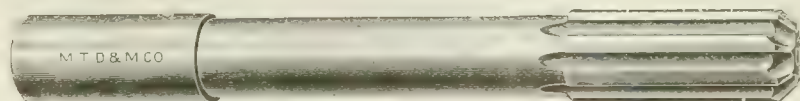
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 Morse Twist Drill & Mch. Co., New Bedford, Mass.
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 Garlock-Walker Machinery Co., Toronto, Ont.
 Independent Pneumatic Tool Co., Chicago, Ill.
 Niles-Bement-Pond Co., New York.
 Prest-O-Lite Co., Inc., Toronto, Ont.
 United States Electrical Tool Co., Cincinnati, Ohio.
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 Canadian Fairbanks-Morse Co., Montreal.
 H. A. Drury Co., Montreal.
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 Morse Twist Drill & Mch. Co., New Bedford, Mass.
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Plewes, Ltd., Winnipeg, Man.
 Pratt & Whitney Co., Dundas, Ont.
 Rice Lewis & Son, Toronto, Ont.
 Standard Machy. & Supplies, Ltd., Montreal, Que.
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 Whitman & Barnes Mfg. Co., St. Catharines, Ont.
 Wilt Twist Drill Co. of Canada, Walkerville, Ont.
 Wilkinson & Kompas, Hamilton, Ont.
 Williams & Wilson, Limited, Montreal, Que.

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 Morse Twist Drill & Mch. Co., New Bedford, Mass.
 Rice Lewis & Son, Toronto, Ont.

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 Cleveland Pneumatic Tool Co. of Canada, Toronto.
 Independent Pneumatic Tool Co., Chicago, Ill.
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 Garlock-Walker Machinery Co., Toronto, Ont.
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 Armstrong Bros. Tool Co., Chicago, Ill.
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 Canadian Fairbanks-Morse Co., Montreal.
 Cincinnati Electrical Tool Co., Cincinnati, Ohio.
 Cleveland Twist Drill Co., Cleveland.
 Garlock-Walker Machinery Co., Toronto, Ont.
 A. B. Jardine & Co., Hespeler, Ont.
 Morse Twist Drill & Mch. Co., New Bedford, Mass.
 Pratt & Whitney Co., Dundas, Ont.
 Rice Lewis & Son, Toronto, Ont.
 Wilt Twist Drill Co. of Canada, Walkerville, Ont.

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Can. Ingersoll-Rand Co., Montreal, Que.
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 A. R. Williams Machy. Co., Toronto.

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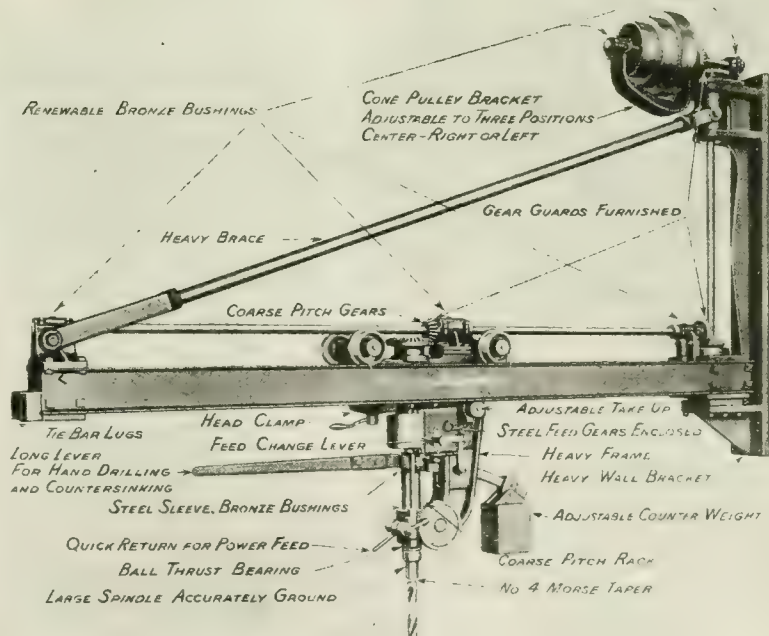
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Get our detailed bulletin covering the machine; you'll certainly be interested.

MADE IN FOUR STANDARD SIZES

Rated size	Drills to center of	Wall to end of arm
7 ft.	14 ft. circle	10 ft.
9 ft.	18 ft. circle	12 ft.
11 ft.	22 ft. circle	14 ft.
13 ft.	26 ft. circle	16 ft.

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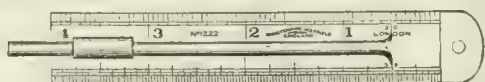
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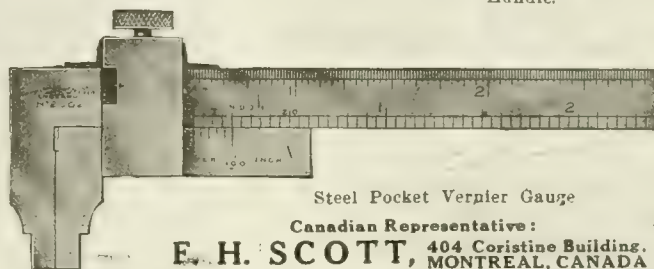
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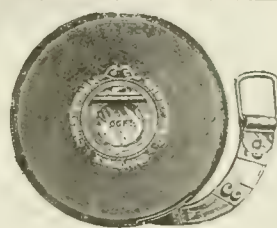
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Cisco Machine Tool Co., Cincinnati, Ohio.
Wickes Bros., Saginaw, Mich.
The Geo. F. Foss Mch. & Supply Co., Montreal.
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Garvin Machine Co., New York.
Gisholt Machine Co., Madison, Wis.
Kennedy & Sons, Wm., Owen Sound, Ont.
R. McDougall Co., Galt.
Niles-Bement-Pond Co., New York.
Reed-Prentice Co., Worcester, Mass.
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Wood Turret Machine Co., Brazil, Ind.
Geo. F. Foss Mch. & Supply Co., Montreal.
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Wells Bros. of Can., Galt, Ont.
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Foster Machine Co., Elkhart, Ind.
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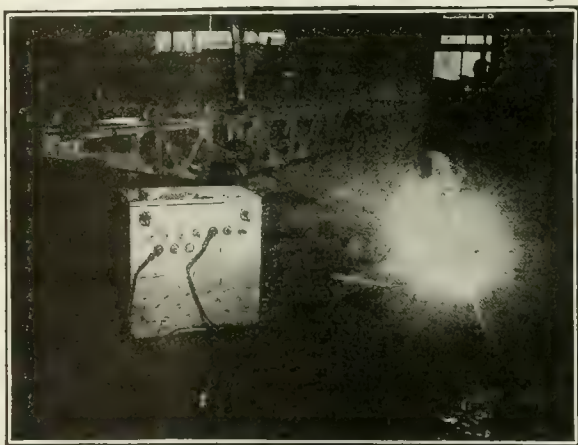
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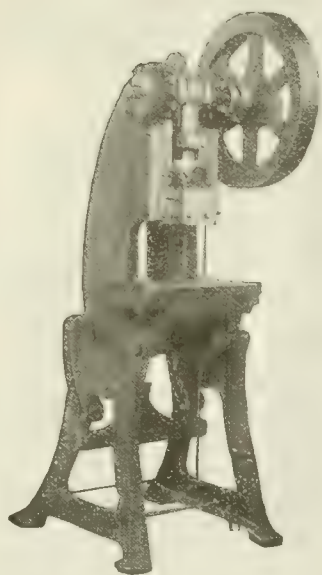
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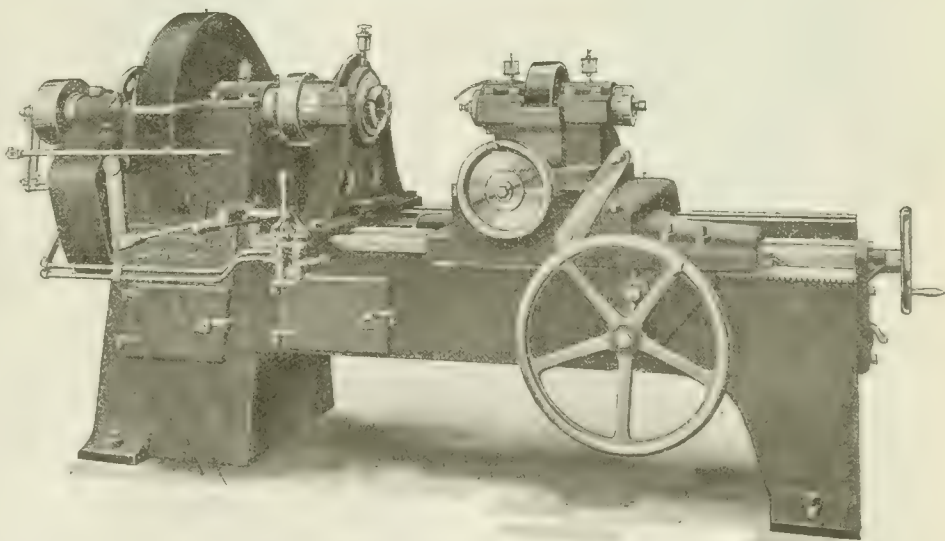
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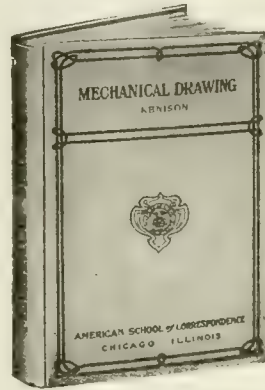
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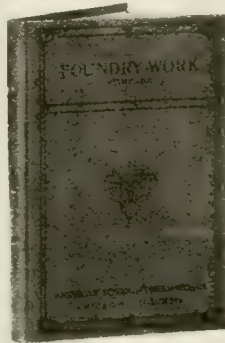


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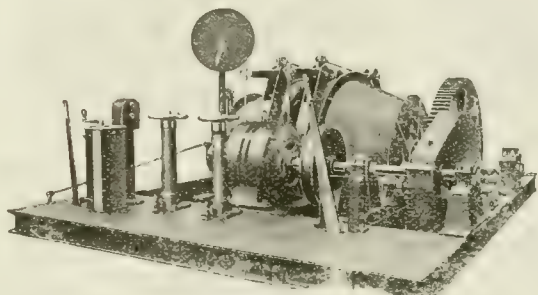
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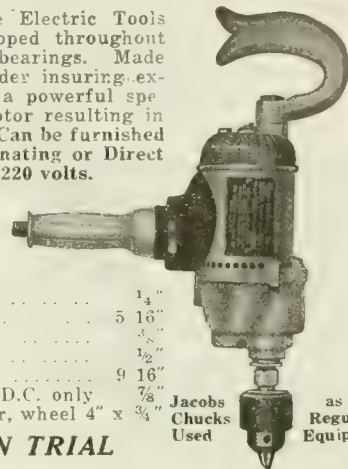
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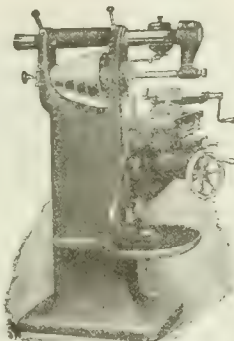
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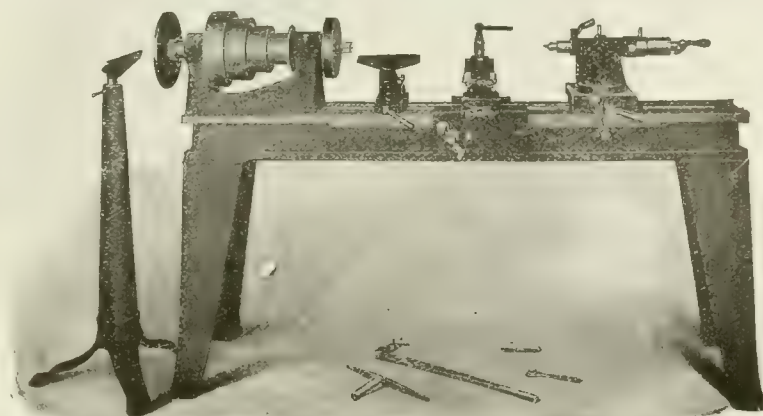
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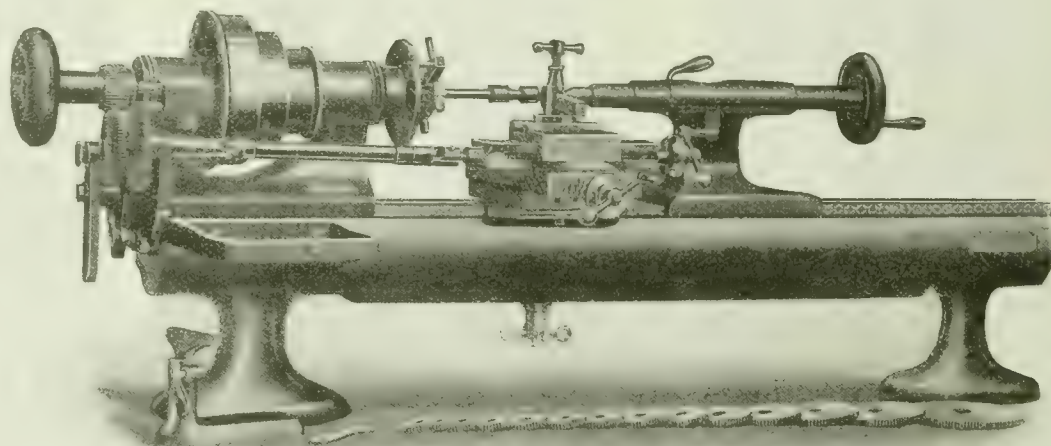
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CANADIAN MACHINERY

AND MANUFACTURING NEWS

A weekly newspaper devoted to the machinery and manufacturing interests.

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No. 9

EDITORIAL CONTENTS

IMAGINATION AND LAYOUT WORK	199
MODERN GRAVITY CARRIERS AND ELEVATORS	203
THE RAPID PRODUCTION OF TEST PIECES	207
MODERN PICKLING MACHINES	208
WELDING AND CUTTING	210
WHAT OUR READERS THINK AND DO	212
DEVELOPMENTS IN SHOP EQUIPMENT	214
EDITORIAL	216
MARKET DEVELOPMENTS	218
Summary....Montreal Letter....Pittsburgh Letter....Toronto Letter....New York Letter.	
SELECTED MARKET QUOTATIONS	223
INDUSTRIAL NEWS	60

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CHIEF OFFICES:

CANADA—Montreal, Southam Building, 128 Bleury Street, Telephone 1004; Toronto, 143-153 University Ave., Telephone Main 7324; Winnipeg, 1207 Union Trust Building, Telephone Main 3449.

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5/8"	196
23/32"	147
3/4"	136
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1 1/16"	120
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45/64"	85
53/64"	25
27/32"	13
7/8"	32
31/32"	11
1"	25
1-1/64"	19

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17/64"	24
9/32"	28
5/16"	48
19/64"	48
21/64"	36
11/32"	60
23/64"	86
3/8"	48
25/64"	259
13/32"	48
27/64"	70
7/16"	62
29/64"	324
15/32"	48
31/64"	199
1/2"	49

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No. 14	195
No. 15	157
No. 16	152
No. 17	44
No. 18	44
No. 19	84
No. 20	54
No. 21	86
No. 22	66
No. 23	71
No. 24	82
No. 25	83
No. 26	35
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No. 30	41
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S	26
T	16
V	182
W	156

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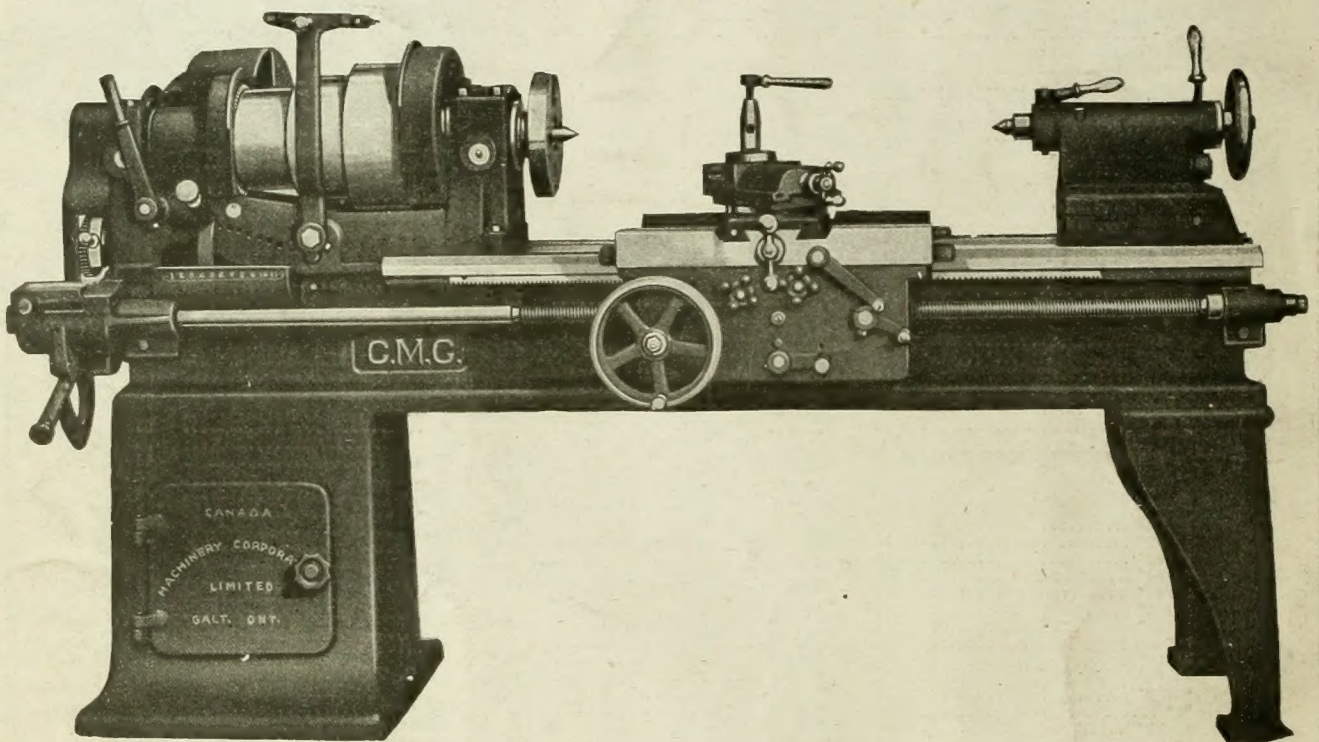
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